

All Electron User  
programs also work  
on the BBC Micro with  
OS 1.2 and Basic II

A Database Publication

# electron user

Vol. 2 No.11 August 1985 £1



Have fun with  
words and puzzles

Play cosmic errand  
boy in Asteroydz

Go diamond hunting  
in our arcade classic

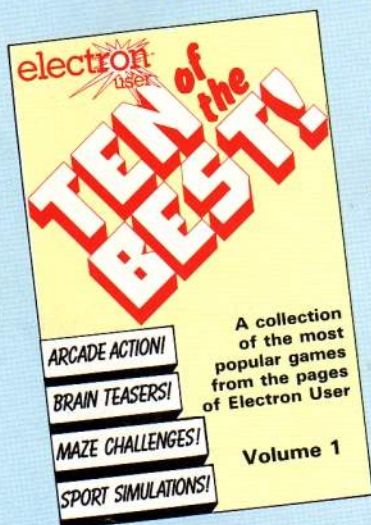
Explore the Electron's  
operating system

Learn how to write  
simple machine code

## All about discs

Start of a new series that will  
help put you on the right track

**Out of the many thousands of programs submitted to Electron User... out of the dozens that have been considered good enough to appear in these pages... we have selected 20 of the most outstanding to delight, intrigue – and frustrate! – Electron users everywhere.**



**Only  
£5.95  
each**

*Please use the  
order form  
on Page 61*



**Volume 1 contains:**

**Jam Butty**

Machine code simulation of high drama on a building site

**Golf**

Play a round by yourself, or play against your pals.

**Haunted House**

Fight against all the odds to get out alive.

**Space Hike**

Another classic. Help the spacemen avoid marauding monsters.

**Park's Peril**

Help Parky through an invisible maze, racing against time.

**Rally Driver**

All the thrills of high-speed driving, with none of the risks.

**Alphaswap**

Your letters are in a twist. Can you put them in order?

**Knockout**

Fast and furious action as you batter down a brick wall.

**Money Maze**

Avoid ghosts and collect coins in an all-action arcade classic.

**Lunar Lander**

The traditional computer game specially written for the Electron.

**Volume 2 contains:**

**Atom Smash**

Machine code thrills as you help to save the world from destruction.

**Bunny Blitz**

Go egg collecting, but keep away from the proliferating rabbits.

**Castles of Sand**

Build castles – but beware the rising tide and hungry sandworms.

**Reaction Timer**

Test your reactions with this traffic lights simulation.

**Solitaire**

The Electron version of the age-old game of logic and patience.

**Jumper**

Jump for your life in this exciting arcade action game.

**Break free**

Test your wits and reflexes in this popular classic ball game.

**Code Breaker**

Crack the code in a colourful if frustrating brain teaser.

**Parachute**

Save the plunging sky divers from a watery end.

**Star Fighter**

Attack the bandit ships in this fast-moving 3D punch-up.



## News

All that's new in the expanding world of the Electron. 5

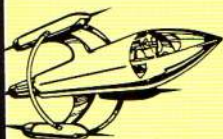
## Beginners

We recap on the course so far. How much can you remember? 10



## M/c code graphics

There's beer galore as you tackle simple character-printing routines. 20



## Dodge the Asteroydz

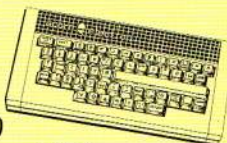
Life sure is hectic out there in space – especially when you've a rogue asteroid on your tail. 16

## Software Surgery

All you wanted to know about the latest in software from our frank reviewers. 27

## All About Discs

First of a new series that will put you on the right track. 30



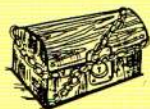
## \*FX

Take a Break and Escape from it all with the second part of our series delving into the operating system. 36



## Digga

This arcade classic is now available on the Electron, thanks to Stephen Martin. 32



## Merlin's Cave

More tips and clues for intrepid adventurers from our tame wizard. 43



## Movelt

Get into order for a puzzling game of strategy and logic. 44

## Micro Messages

The pages you write yourself. A selection from our mailbag. 49

## Hardware

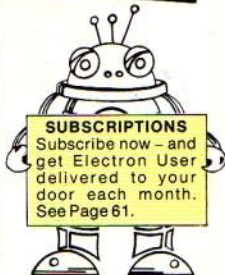
Slogger's Rombox is given a thorough test. 53

## Hexgram

An educational program that will increase your word power. 54

## Order form

Take out an annual subscription, order a back issue, tape, dust cover or binder. ... all on one simple form. 60



**SUBSCRIPTIONS**  
Subscribe now – and get Electron User delivered to your door each month. See Page 61.

Subscription rates for 12 issues, post free:

£12 UK  
£13 Eire (IR £16)  
£20 Europe  
£20 Rest of world (surface)  
£40 Rest of world (airmail)

**Published by Database Publications Ltd**  
**Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.**

Telephone: 061-456 8835 (Editorial) 061-456 8383 (Administration) 061-456 8500 (Advertising)  
Subscriptions: 061-480 0171. Telecom Gold Mailbox: 79 MAG001. Prestel: 614568383.  
Telex: 265871 MONREF G. Quoting Ref. 79 MAG001.



18.052 July-Dec 1984

Managing Editor  
**Derek Meakin**  
Features Editor  
**Pete Bibby**  
Production Editor  
**Peter Glover**  
Layout Design  
**Heather Sheldrick**  
Advertisement Manager  
**John Riding**  
Advertising Sales  
**John Snowden**  
Editor in Chief,  
Database Publications  
**Peter Brameld**

News trade distribution: Europress Sales and Distribution Limited, 11 Brighton Road, Crawley, West Sussex RH10 6AF. Circulation 0293 27053.

Electron User is an independent publication. Acorn Computers Ltd, manufacturers of the Electron, are not responsible for any of the articles in this issue or for any of the opinions expressed.

Electron User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

© 1985 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles or listings.

# The ultimate guide to the Electron!

ONLY  
**£9.45**  
inc. P&P

This detailed guide to the Electron's operating system is a must for every serious Electron user.

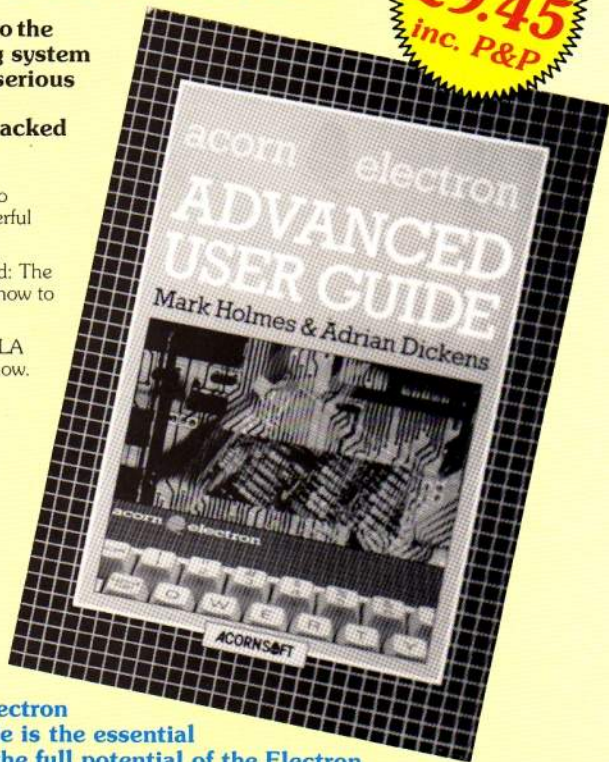
In its information packed pages you'll find:

- ★ Full details of how to implement the powerful \*FX/OSBYTE calls.
- ★ Page ROMs revealed: The way they work and how to write your own.
- ★ Programming the ULA – all you need to know.
- ★ Full coverage of memory allocation and usage – make every byte count.
- ★ Complete circuit diagram: How to use the Electron's exciting expansion capabilities to the full.

and much,  
much more...

**Quite simply, the Electron Advanced User Guide is the essential guide to exploiting the full potential of the Electron.**

**Make sure of your copy.**



☐ Please send me a copy of Acorn Electron Advanced User Guide, £9.45 (including p&p)

Payment: please indicate method (✓)

☐ Access/Mastercard/Eurocard

No. \_\_\_\_\_

☐ Barclaycard/Visa

No. \_\_\_\_\_

☐ Cheque/PO made payable to Database Publications Ltd.

Name \_\_\_\_\_ Signed \_\_\_\_\_

Address \_\_\_\_\_

Send to: **Database Publications, FREEPOST, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.**

(No stamp needed if posted in UK) Please allow 28 days for delivery

Don't forget to quote your credit card number and give your full address.

**You can also order by phone:**

**061-480 0171**  
24 hours



# electron user NEWS

## Electron users go for Gold

WHEN Electron users can finally link their micro to the telephone they will be able to join one of the most ambitious communications developments of 1985.

MicroLink is a nationwide network of computer enthusiasts, set up by Database Publications in association with Britain's national electronic mail service, Telecom Gold.

Its members use a wide range of micros, from the Spectrum to sophisticated business machines – and they can all talk to each other via the Telecom Gold mainframe in London.

And because they use high-speed PSS, which has input points all over Britain, more than 90 per cent of them can do this at local call rates.

With MicroLink you will also be able to use your Electron as a telex terminal – which would cost you £2,000 to buy separately.

Watch for details of how to join MicroLink – and play your own part in the communications revolution – in future issues of *Electron User*.

# Communications pack opens door to world

A REVOLUTIONARY communications package for the Electron is being tested behind locked doors in the heart of Yorkshire.

Developed jointly by Acorn and Pace Micro Technology of Bradford, the project – currently top secret – will enable Electron users for the first time to reap the benefits of the telecommunications explosion.

*Electron User* understands that the device is an interface card which has been designed to fit into a socket on the back of the Plus One.

The card has an eeprom on board which contains the critical software, so eliminating

the need to load the program from disc or tape.

Questioned about the hush work being undertaken at the company headquarters, a Pace spokesman admitted that the communications package is a reality.

"Yes we are working on it", he agreed. "But at the moment it is impossible to predict an exact date when it will be available or what the price tag will be".

However since then *Electron User* has learned that the communications package will almost certainly be on sale at the Electron and BBC Micro User Show to be held in Manchester in September.

"It will certainly be ready by then", a company source revealed.

It was apparently Acorn who approached Pace, already a major force in the communications field, to achieve

the breakthrough for the Electron.

The company is well known for its bestselling Nightingale modem and Commstar communications software for the BBC Micro.

And Andy Hood, the author of Commstar and currently software development manager for Pace, was selected to write the communications program for the Electron.

"The end product will make the Electron behave like the BBC Micro with Commstar", claimed the Pace source. "And that will open up a whole new exciting on-line world for Electron users..."

## DATABASE ON ROM

SLOGGER claims to be the first company to produce a database on ROM for the Electron.

Its newly-released StarStore allows the storage and retrieval of information, putting it into order, printing it selectively and producing mailmerge files.

The £29.95 database was written specifically for the Electron and to complement another Slogger product, the StarWord word processor.

## NEW SOFTWARE LINK

A FURTHER disc interface has been brought out for the Electron which will allow access to a wider range of software.

The latest system, from Advanced Computer Products, is a ROM sideways adapter board and 1770 DFS.

Using them together the Electron will be able to access a range of programs intended for the BBC Micro and the new BBC+.

ACP does warn, how-

ever, that BBC programs which use Mode 7 will not run because the Electron has no facility for its use, although it will be possible to read the listings on screen.

The sideways ROM adapter board, which connects to the Acorn Plus 1, allows the user to plug in two eeproms such as graphics or ACP's own Advanced Disc Toolkit.

This was not possible before because the Electron only has two

cartridge slots.

The 1770 DFS, which will be supplied on eeprom, can be put into the adapter board. Because the BBC+ uses the same chip its incorporation in the Electron will allow the user to gain access to BBC programs on disc.

At the time of going to print product names or prices had not been set although an ACP spokesman said the board was likely to cost under £15.

## Add-on for the Plus 1

NEW from Solidisk, the STL-EFS for the Electron combines 16k sideways RAM, single and double density disc interface, running both BBC DFS format and Plus 3 ADFS discs with a socket for a Winchester drive.

It plugs into any slot on the Plus 1 and costs £59.

Solidisk also has a special disc pack offer consisting of a Mit-subishi 3½" 80 track double-sided drive with built-in PSU, the EFS card and four discs for £200.

## MUTANT BATTLE

A COOL head is needed by Electron users wanting to pit their wits against Bevan Technology's latest creations.

Harker, Septives, Invulnos and Vilox are just some of the mutants and alien beings featured on the company's Aabatron and One Last Game.

In Aabatron the beings from another world can only be shot while moving on some screens and on others only while stationary. One Last Game is similar but it is an advanced defender rather than attacker game.

Distributed by CBS, both cost £7.95.

# Log-on and enjoy a king-sized barney

**MODEMS have been on overtime during a heated row between Electron software publisher Kosmos and Micronet 800 that has been entertaining telecomputing enthusiasts in recent weeks.**

What started as an argument about qualifications of educational software reviewers has spilled over into areas such as the standards of electronic journalism and the merits of multiple choice versus traditional methods of testing knowledge levels.

The dispute began when Micronet ran a review by T.D. Brovnik of the Kosmos geography quiz program "Identify Europe".

Brovnik's assessment included the comments "unimaginative" and "ineffective" and concluded: "But for its high resolution colour display, this program could have been written 15 years ago".

Kosmos boss Keith Spence was incensed by the review and complained to Micronet about "imbecilic ramblings of an individual obviously totally unqualified to judge the merits of educational software".

Spence said the

review was "an insult to myself, my company, the author, and the educationalists involved in the program's formulation and design."

"Educational software reviews must be carried out by a responsible educationalist — not by someone whose capacities do not extend beyond steering colourful blobs around games software screens."

"The reviewer, while wallowing in his egotism, has even had the audacity to challenge the multiple choice answers technique and to suggest we were not capable of writing software incor-

porating direct response analysis.

"It is hard to believe your reviewer could publicly admit to such a fundamental ignorance of modern teaching and testing techniques".

Spence gave Micronet 24 hours to remove "this worthless and damaging 'review' under threat of severing his association with the network, withdrawing his advertising — and cancelling his agreement to appear on Micronet's Celebrity Chatline.

Micronet responded by publishing Spence's views on the network along with the statement: "Our reviewer has been a lecturer in computer science for the past five years, and worked for three years at the Council for Educational Technology as a researcher in computer aided learning".

But Jeff Hughes of Liverpool SPS Advisory Centre mailbox: "It seems that we continue to suffer the presumption that those who teach computer studies are experts in edu-

cational computing.

"The record of CET is nothing to write home about, most advances being made in spite of their influence rather than otherwise".

Barbara Conway of Starlight came to Micronet's defence with: "...a small bouquet over the way you reacted to the Kosmos attempt to force you to change an adverse review of one of their programs".

But Richard Ross-Langley, managing director of Mine of Information, mailbox Keith Spence with: "While not commenting on your specific case, I support the principle to get Micronet to behave more responsibly.

"So many of their articles add flippancy and snap judgements that one hesitates to call it news".

At press time both Micronet and Kosmos were claiming strong support for their respective points of view. Meanwhile network subscribers were enjoying the battle of words from the sidelines.

MICRONET 800 (C) 800111893a op  
Kosmos Letter 1:06:85  
From K.L. Spence, Kosmos Software  
Dear Sir  
Having provided considerable support for Micronet through advertising, competition sponsorship and countless personal recommendations within the computer industry, you will understand my extreme disappointment and alarm on reading the "review" of our program IDENTIFY EUROPE within your pages.  
The "review" contains imbecilic ramblings of an individual obviously totally unqualified to judge the... more... #  
GOTO 1 Next Story 8 Newsflashes  
GOTO 2 News Index 9 A-Z Index

## Educational database

A SYSTEM to make selection of educational software as painless as possible for Britain's schools, colleges, universities and education authorities has come from distributor Vector Marketing. Educational

establishments can now telephone 0933 79300 or write to Vector stating the subject, age group, type of computer and data system the software is required for.

Vector will then process this information

through its database of more than 7,500 educational titles and supply a free printout showing the programs available, together with a brief description of the content, order code and price.





# Electron joins the battle against tooth decay

GETTING its teeth into the sticky problem of tooth decay is Chester Health Authority.

The authority is hoping to improve dental health education with the aid of new technology – in this case an Electron.

"The use of the

microcomputer in general education is well-proven and well established", said Mr Anthony Jenner, Chester's district dental

officer.

"Its use in the context of health education in schools has however been much more cir-

cumscribed with little or no evaluation".

To help them decide Chester HA has given a place to the Electron in its converted ambulance "teaching" bus which tours local schools.

Included in the package is a home-produced program designed to use the computer's graphics and sound to full effect to attract attention and so teach children how to look after their teeth.

Fast and colourful animated characters, in a simulated fruit machine setting, react when a child answers a series of multiple choice questions on dental health.

The right or wrong choice makes the characters move and a jingle play accordingly.

A cumulative score is displayed, and is also

memorised for later analysis by the Health Authority.

Mr Jenner said he hoped the use of new technology would prove to be both efficient and effective.

"Health authorities are manpower-intensive organisations, and quite clearly any use that can be made of technology in repetitive functions, providing that it is being properly evaluated, will have quite significant effects on resources.

"When using new technology it is important to determine whether it produces knowledge gains greater or less than that produced by more conventional teaching.

"The current evaluation will, it is hoped, provide answers to this question".



Learning about healthy teeth – on an Electron

# SOLIDISK EFS COMBINES DISC AND A SOCKET FOR THE WI

Solidisk Double Density DFS is now the ultimate in reliability and supported by the largest amount of software available for the Electron.

Solidisk relies on a good product and a large support network to win the heart of the user.

With over 75 Local Experts, covering England, Scotland and Wales, Solidisk can offer many users regional free fitting and advice.

With an ever increasing catalogue of free software, even users who are new to the Disc system can expect to build up a large library in a fairly short time.

Solidisk Software Support Service already has responsibility for over 50,000 BBC computer users and the ability to give you the best service matched only by the largest companies.

Solidisk Double Density DFS handles both BBC Discs and Electron Discs, in single and double density whereas the Acorn's PLUS 3 can only handle ADFS discs.

Solidisk ADFS has nice features such as automatic disc format sensing, built-in disc formatter and verifier and programmable disc speed.

It also has more than 20 disc utilities built into the ROM.

Standard features for both BBC DFS and ELECTRON ADFS implementations include:

1) Automatic Write Error Correction.

2) Automatic 40/80 track stepping, the ADFS 2.1 will let you read and write 40 track discs if you have an 80 track drive.

3) Disc repair facilities.

Disc sector editor (\*DZAP), memory editor (\*MZAP), recover good sectors (\*RECOVER) rewrite multiple sectors (\*RESTORE), read bad sectors and bad track (\*RTRACK), repair and restore bad sectors and track (\*WTRACK) and the powerful disc copy (\*DCOPY) which is capable of duplicating even some non BBC discs.

4) Tape to disc facilities.

Direct transfer from tapes to disc (\*TAPEDISC) will work with all unprotected programs. \*TAPELOAD and \*TAPESAVE will cope with more difficult ones. Only in some cases (multipart games cassettes) will you need Solidisk tape copier.

5) Wordprocessing facilities.

This facility allows \*BOOT and other text files to be edited, saved and printed in any screen mode.

6) Automatic disc format sensing.

On Shift-Break, the STL ADFS 2.1 will detect the disc format and use the right BBC DFS or Electron ADFS to run.

On the Electron ADFS side, the 2.1 ROM also has some very nice features:

1) Extensive Disc formatting facilities.

\*FORM40, \*FORM80, \*FORM160 and \*WFORM (for the Winchester) are available to handle any disc drive.

2) Disc verifying facilities.

\*VERIFY will check all disc sizes including Winchester for media defects.

3) Number of opened channels.

This is the star feature of Solidisk ADFS.

This facility (\*OPEN) allows you to specify how many files will be opened in a program, thus maximising the available RAM while avoiding buffer page swapping as on the Acorn ADFS.

It leaves PAGE at &1900 for most programs, gives more room to View and Viewsheets and avoids unnecessary conversion work for many programs originated for the BBC DFS to be run on your Electron.

On the BBC DFS side, the STL ADFS 2.1 handles both single and double density and in addition, it supports:

1) Unlimited catalogue entries.

2) Unlimited filesize.

## THE SOLIDISK 16k SIDEWAYS RAM:

Solidisk Sideways RAM is an almost indispensable add-on for the Electron with disc drives.

The Sideways RAM occupies the same memory area as the BASIC or ADFS ROM in the micro's memory map. This means that Sideways RAM can run almost any ROM type software,

including languages, utilities and games.

Sideways RAM is notably invaluable to run games and specially "MEGAGAMES".

Games and programs run at 2MHz clock speed in Sideways RAM, if loaded into the Electron RAM, they can only run at 1MHz clock speed, ie half the speed of Sideways based games.

Megagames are too large to be run on the unexpanded Electron.

They use extensively 8 colour high resolution screen (mode 2), background music, sound and

high speed sprites.

Solidisk supply free software to maximise the use of Sideways RAM on the Electron. These include Wordprocessor, Spreadsheet, Database, Toolkit, Machine Code Monitor, Printer Buffer, Sprites, Playtunes, Virtual Memory Processor, VDU Replay, Screen Effects, digitised pictures etc...

## THE WINCHESTER SOCKET:

Solidisk has the most powerful Winchester system for the BBC computers and the Electron. The Winchester system can provide from 20 Megabytes to a theoretically possible 1300 Gigabytes of storage, directly on line with the Electron.

The same Winchester unit can be used on the BBC B, the BBC PLUS and the Electron without any change.

You can read more about it in BBC Micro User or in Acorn User Magazines. Price of a 20 Megabytes system is only £700.00 + VAT (£805.00).





# UPGRADE, 16K SIDEWAYS RAM WINCHESTER FOR ONLY £59.00

## SOLIDISK SPECIAL MITSUBISHI DISC OFFER:

This offer comprises:

- One 80 track Double Sided (640 kbytes) 3.5" Mitsubishi disc drive with its own PSU. Cased in beige.
- Solidisk EFS Disc Upgrade, 16K Sideways RAM and Winchester socket.
- One software package containing four 3.5" discs, detailed below.
- Full one year guarantee and 2 manuals.

**PRICE: £200.00**

You can also order as many Megagame Packs at the same time as you like. Each Megagame Pack consists of three 3.5" discs and contains on average 20 games.

### THE SOFTWARE:

The software contains everything to start a library: the big four (Database, Wordprocessor, Spreadsheet and Graphic), Utilities and Games.

### Database:

Solidisk Database is very easy to understand and use. You are presented with a 15 option Menu. Each option will lead to a new Menu and so on. Mode 3, 80 column screen is used throughout so that what you see is what will be printed on paper. With Solidisk Database, you can create as many records as you like, each record can be up to 15 fields of up to 60 characters. You can sort, search, index, mailmerge, append, create subset, calculate etc. Solidisk use the same Database to process all your orders.

### Wordprocessor:

Solidisk Wordprocessor is WYSIWYG type (What You See Is What You Get) and has all the commands of a professional tool. It features 80 column screen, on screen justification, page numbering, search and replace, word count, free space, Wordstar like editing commands: insert and overwrite, block mark, move, copy, delete, save, load to cursor, \* commands etc...

### Spreadsheet:

Solidisk Spreadsheet is also Menu driven and has the same file

structure as Solidisk Database. You can have as many rows and columns as you like, each column can be as small as two characters wide or as big as 70 characters. All maths functions are



supported. Recalculate, Replicate, Print, Print If, Sort, Search, Define Zone, Mailmerge, Text Input/Output etc... are included.

### Toolkit:

Solidisk Toolkit is almost indispensable for Electron programmers, it has 24 star commands (Status, Rwipe, LVAR, Move, Search and Replace, Expand, Salvage, Keyload etc...).

## ORDER FORM

### PRICE LIST and ORDER FORM.

	Price	P&P
Diskettes.		
Verbatim 3.5" box of 10	£40.00	£1.00
Software Pack	£10.00	£1.00
Solidisk EFS	£59.00	£1.00
Disc Offers.		
640k Mitsubishi MF453 Disc Outfit	£200.00	£3.00
1.3 MB Fantastic Offer	£310.00	£3.00
20 MB Winchester system	£805.00	£10.00

Total =

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Payment ☐ Cheque ☐ Cash or Postal Orders  
☐ Bank transfer ☐ Other means.

Access or Barclay Credit  
Card Account: \_\_\_\_\_

You can  
also order by phone 0702 354 674  
9AM-5.30PM

SEND TO:  
SOLIDISK TECHNOLOGY LIMITED,  
17 SWEYNE AVE.  
SOUTHEND ON SEA,  
ESSEX SS2 6JQ.

We reserve the right to change specifications and prices for improvements.

WE'VE come a long way in the 18 months since this beginners' series started. There've been a lot of programs written, from our early treatment of PRINT to last month's exploration of REPEAT...UNTIL loops.

In this article I intend to take a brief look at all we've done so far before we journey into less basic Basic in the months to come.

We started off way back in February, 1984, using PRINT to make things appear on screen in direct or command mode. We saw that:

```
PRINT "HELLO"
```

produced the HELLO onscreen and that we could put any message we wanted inside the inverted commas and it would be printed.

At the same time, however, we learnt that the Electron is very fussy and will only accept Basic keywords if they are spelt correctly and in upper-case letters.

Attempts such as:

```
print "HELLO"
```

and

```
PRINT "HELLO"
```

only succeeded in producing the first of what was probably a long series of error messages!

However, we didn't just stick to displaying such exciting messages. We also had PRINT doing our sums for us with commands like:

```
PRINT 2+3
```

and

```
PRINT 4/2
```

Notice the computer's symbols for multiplication and division and remember the difference between:

```
PRINT 2+3
```

and

```
PRINT "2+3"
```

The next month saw us entering the world of programming with Program 1.

```
10 REM PROGRAM 1
20 PRINT "ELECTRON"
30 PRINT "USERS"
40 PRINT "ARE"
50 PRINT "BRILLIANT"
```

Program 1

# Now let's refresh your memory...

**PETE BIBBY**  
reviews progress  
to date before  
venturing deeper  
into the less  
basic aspects of  
Basic programming

I hope that, with all you've learnt, you now find this program pretty painful. There are better ways of achieving the same result practically crying out to be used.

However, it was our first program and deserves a little respect. Also it did illustrate some important points when we used RUN to set it in motion.

Like all programs, it was executed by the Electron line by line.

It started at the lowest number – in this case 10 – and worked its way through lines 20, 30, 40 and 50 until there were no more lines for it to process.

Then the program ended and the Electron waited for

further instructions. One of these, LIST, produced the aptly-named listing of the program.

We learnt we could alter the program, adding a line such as:

```
45 PRINT "VERY"
```

or completely erasing one by entering its number and pressing Return.

By now the screen was getting to be a bit of a mess, so finding that CLS cleared the display was a relief.

Only the display was cleared, however. The program remained in memory and could be inspected with a LIST. It was left to NEW to obliterate a program from the Electron's memory.

April 1984 had us entering

the world of variables but not until we'd had another look at PRINT.

We saw that:

```
PRINT "HELLO"
```

```
PRINT "HELLO"
```

produced different output from:

```
PRINT "HELLO";
```

```
PRINT "HELLO"
```

or

```
PRINT "HELLO"
```

```
PRINT "HELLO"
```

As we soon learnt, it's not only spelling that's vital in Basic – punctuation is important as well.

Going on from this we came to the REM command which allowed us to annotate programs with remarks.

These remarks are ignored by the micro but can be vitally important to humans trying to figure out what's happening – or, more likely, not happening – in a program.

Finally, we came to the idea of variables as labels for the messages in our PRINT commands.

We saw that we could use a string variable – such as `message$` – to hold a string and then use that variable to display the message.

It may not seem all that



much now, but assignments like:

```
LET message="You don't
need the LET"
```

make up the basic building blocks of all worthwhile programs. Incidentally, when you:

```
PRINT message$
```

you'll be reminded that the Electron doesn't need the LET.

Once we'd started on variables there was no stopping us. The May instalment saw how variables could be used to store numbers as well as strings.

These numbers didn't need the dollar sign at the end of their names. Using them we could write programs such as Program II.

```
10 REM PROGRAM II
20 width=10
30 height=20
40 area=width*height
50 PRINT area
```

Program II

Notice that this program not only does its job, it can be seen to be doing its job because the variable names are meaningful.

It makes a lot more sense than Program III, which does exactly the same task.

Can I make a plea here for more use of meaningful variable names in programs? They

RULE	WRONG	RIGHT
No spaces in variable name	sleeping dogs = 3	sleeping_dogs = 3
Must not start with number	2nd time = 35	secondtime = 35
No punctuation marks in name	peter's = 9	peters = 9
No arithmetic operators included in name	night+day = 24	nightandday = 24
Must not begin with a Basic keyword	LETTERS = "a"	letter\$ = "a"

Table 1: Rules for naming variables

```
10 REM PROGRAM III
20 W=10
30 H=20
40 A=WH
50 PRINT A
```

Program III

may take a little more time to type in but they add enormously to a program's clarity. This can be a blessing when the time comes to alter or debug your masterpiece! Table I gives the rules for variable names.

June 1984 saw us using INPUT to get information into programs while they were actually running.

When the program came to an INPUT statement it waited patiently until a value was entered at the keyboard. This was then stored in the

appropriate variable and the program carried on.

Program IV shows how much Program II can be improved using INPUT.

```
10 REM PROGRAM IV
20 INPUT "Width",width
30 INPUT "Height",height
40 area=width*height
50 PRINT area
```

Program IV

Now the program is much more general in its application. Notice how the message in inverted commas after the INPUT is printed. It's good practice to prompt the user as to what is wanted.

Can you remember what altering the program with lines like:

```
20 INPUT "Width",width
```

or

```
30 INPUT "Height",height
```

does? Punctuation marks are just as important with INPUT as with PRINT.

The next four months saw us exploring the intricate world of FOR...NEXT loops.

Combined with the INPUT command they can make even simple programs quite powerful. Program V shows what I mean.

```
10 REM PROGRAM V
20 FOR loop=1 TO 5
30 INPUT "Width",width
40 INPUT "Height",height
50 area=width*height
60 PRINT area
70 NEXT loop
```

Program V

Here our simple Program II



## From Page 11

becomes much more general in application, allowing five different areas to be calculated.

This could easily be altered with lines such as:

```
20 FOR loop=1 to 10
```

or

```
FOR loop=10 TO 90
```

which show how flexible it is.

Can you figure out how many areas will be calculated with:

```
20 FOR loop=1 to 10 STEP 2
```

If you find that puzzling, have a look at the August 1984 article.

In September we investigated nested loops, when one set of FOR...NEXT loops is totally enclosed in another. Program VI shows how it's done.

```
10 REM PROGRAM VI
20 FOR outer=1 TO 10
30 FOR inner=1 TO 10
40 PRINT "*";
50 NEXT inner
60 PRINT
70 NEXT outer
```

Program VI

When you think you've understood that, can you explain what's happening when line 30 becomes:

```
30 FOR inner=1 TO outer
```

And can you make the triangle go the other way around?

November and December had us looking at new ways of arranging data in the form of one and two-dimensional arrays.

Here a group of variables were linked together under a common name, each distinguished from the other by the number in brackets at the end of the name.

The joy of this arrangement is that you can get at a whole list of similar data just by changing the number at the end of the variable name. Program VII gives a simple example.

Here two arrays are set up by the DIM of line 20. Both the

```
10 REM PROGRAM VII
20 DIM counter(3), names(3)
30 FOR cycle=1 TO 3
40 counter(cycle)=cycle
50 PRINT "Enter name 'ic
ycle
60 INPUT names(cycle)
70 NEXT cycle
80 CLS
90 FOR loop=3 TO 1 STEP
-1
100 PRINT;counter(loop),n
ames(loop)
110 NEXT loop
```

Program VII

following FOR...NEXT loops use these arrays, the first to take in the data, the second to print it out in reverse.

From this you'll remember how powerful the combination of FOR...NEXT loops and arrays can be.

However, at this time we were still stuck to using INPUT to get information into a program. It wasn't until January of this year that we read about READ.

Using READ we can take, or read, information held in a DATA statement and use it in the program. Program VIII shows it in action, replacing the INPUTs of Program VII.

```
10 REM PROGRAM VIII
20 DIM counter(3), names(3)
30 FOR cycle=1 TO 3
40 counter(cycle)=cycle
50 READ names(cycle)
60 NEXT cycle
70 CLS
80 FOR loop=3 TO 1 STEP
-1
90 PRINT;counter(loop),n
ames(loop)
100 NEXT loop
110 DATA Bodger,Spot,Eile
en
```

Program VIII

Once we'd got used to using READ and DATA we were able to use them to explore the conditional IF...THEN statements.

Up until then, the program

Operator	Meaning
=	equals
<	less than
>	greater than
<>	not equal to
<=	less than or equal to
>=	greater than or equal to

Table 1: Logical operators

had obeyed every line it came to in order. Now, however, we were able to make conditions for the program. It was only to perform an action IF a particular condition was true.

In Program IX the condition is that *number* should be greater than 5 and the action performed is a simple message.

```
10 REM PROGRAM IX
20 FOR loop=1 TO 10
30 READ number
40 IF number > 5 THEN PRI
NT number;" is greater than
5"
50 NEXT loop
60 DATA 5,9,3,-1,0,100,8
,4,0.5,2
```

Program IX

Can you understand why the micro acts as it does? If not, THEN have a look at last February's article. Table II shows all the conditional operators used in IF...THEN statements. Why not use a few in line 40 and try to predict the results?

Last Spring saw the beginners' series working its way through the various ramifications of the conditional statements.

Simple conditions were made into more complicated ones using the logical operators AND, OR, and EOR.

We saw the use of logical variables acting as flags and how:

PRINT TRUE, FALSE

produced numbers representing true and false.

Finally ELSE was dealt with. IF you remember all that THEN carry on ELSE you'd better re-read the relevant articles.

With summer came a rather bizarre feature on the use of GOTO which I went on at length about and then advised you never to use it.

And July saw the introduction of the REPEAT...UNTIL loop which allows a piece of code to be repeated over and over until a condition is met.

Program X, the final program this month, shows how flexible this is.

```
10 REM PROGRAM X
20 REPEAT
30 INPUT "Width",width
40 INPUT "Height",height
50 area=width*height
60 PRINT area
70 UNTIL area<=0
```

Program X

It's our old friend Program II again, but notice how much more powerful it is. Now it'll carry on until you give it a negative width, then stop.

And that's where I stop for this time.

I hope you've enjoyed this recap of what we've covered and that you'll look up any articles that you might not be too sure of.

It's amazing what we've learnt so far. Next month we'll be returning to our exploration of Basic.



## Advanced Disc Toolkit

# 16k EPROM

## containing over 30 commands

including

format • verify  
free disc space • disc editor  
menu • memory editor • file transfer  
memory/disc/basic program search • file copy  
read/write sectors • load & move file in memory  
envelope & function key definitions • move memory block  
compare files/discs • list file & directory names (ADFS utility)  
'unplug' roms • catalogue roms • display current filing systems

## Advanced Computer Products presents . . . PROBABLY THE MOST VERSATILE TOOLKIT EVER

### FEATURES...

- automatically operates with DFS or ADFS
- disc editor works in 40/80 cols. allowing complete sectors to be viewed @ one time
- memory editor operates within screen windows and in all modes! variable format permits over 2k of memory to be displayed on one screen
- examine/edit memory on both sides of TUBE®
- 6502 disassembler displays OS names
- search memory, disc or basic program for occurrence of string with wildcard
- read from or write to any part of the disc
- avoid conflicting commands by 'unplugging' roms
- ADFS disc utilities become rom-based in ADT

**SPECIAL INTRODUCTORY PRICE**  
**ONLY £29**

+p.p. & VAT

**Comprehensive Instruction  
Manual Included**

**ORDER  
NOW**

### COMPATIBLE WITH...

- \* BBC, B+, ELECTRON†
- \* DFS, 1770 DFS, ADFS
- \* 2nd Processor

†(when fitted with 'Plus 1' & rom adaptor board)  
Please contact us for details of  
New ROM Adaptor Board

Please send me \_\_\_\_\_ Advanced Disc Toolkit  
@ £34.50 (inc. p&p + VAT) each  
I enclose payment for £ \_\_\_\_\_  
My name \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_

Please send to:  
Advanced Computer Products Ltd.  
6 Ava House, High Street, Chobham,  
Surrey GU2 4BL (Tel. 0276 76545)

**Electron & Tube are trade marks of Acorn Computers Ltd.**

# QUICK TO LEARN

## THAT'S...

# MINI OFFICE

**JUST LOOK WHAT THIS PACKAGE CAN DO!**

**WORD PROCESSOR** — Ideal for writing letters or reports! *Features:* Constant time display ● Constant word count (even shows words per minute) ● Normal or double-height text on screen or printout.

**SPREADSHEET** – Use your micro to manage your money! *Features:* Number display in rows and columns ● Continuous updating ● Update instantly reflected throughout spreadsheet ● Save results for future amendments.

**GRAPHICS** – Turn those numbers into an exciting visual display! *Features:* 3D bar chart ● Pie chart ● Graph.

**DATABASE** – Use it like an office filing cabinet! *Features:* Retrieve files at a keystroke ● Sort ● Replace ● Save ● Print ● Search.

SPREADSHEET

	A JANUARY	B FEBRUARY	C MARCH
1. MONEY			
2. MORTGAGE	85.72	85.72	85.72
3. FOOD	42.86	42.86	78.45
4. CLOTHES	42.86	42.86	78.45
5. LUXURY	42.86	42.86	78.45
6. OTHER	42.86	42.86	78.45
7. TOTAL	214.28	214.28	370.90
8. EARNINGS	214.28	214.28	370.90
9. TAXES	42.86	42.86	78.45
10. SAVINGS	42.86	42.86	78.45
11. DEBT	42.86	42.86	78.45
12. TOTAL	214.28	214.28	370.90

DATABASE

RECORD No. 1

SURNAME: JONES  
FIRST NAME: SIMON  
ADDRESS: 6 BROAD LANE  
ADDRESS: LIVERPOOL  
TELEPHONE: 051-577 8000  
AGE: 40

RECORD NO. 1

SURNAME: ANDREWS  
FIRST NAME: JAMES  
ADDRESS1: 12 ELF ROAD  
ADDRESS2: WEREFORD  
TELEPHONE: 321-621451  
AGE: 13

RECORD No. 2

SURNAME: ANDREWS  
FIRST NAME: PETER  
ADDRESS1: 12 ELF ROAD  
ADDRESS2: WERFORD  
TELEPHONE: 021-827451  
AGE: 19

RECORDED 1902-11-15

RECORD 101  
SURNAME: ANDREWS  
FIRST NAME: PETER  
ADDRESS1: 10 ELF ROAD  
ADDRESS2: HENFORD  
TELEPHONE: 021-622451  
AGE: 19

RECORD NO. 7

SURNAME: SMITH  
FIRST NAME: JANE  
ADDRESS1: 42 HIGH STREET  
ADDRESS2: SALFORD  
TELEPHONE: 021-61431  
AGE: 27

RECORD NO. 2

SURNAME: BRINK  
FIRST NAME: VIEITH  
ADDRESS1: 15 HILL ROAD  
ADDRESS2: WARRINGTON  
TELEPHONE: 853-80923  
AGE: 20

RECORD NO. 4

SURNAME: YATES  
FIRST NAME: IAN  
ADDRESS1: 177 FORD ROAD  
ADDRESS2: GULLHAM  
TELEPHONE: 452-486 7654  
AGE: 35

REPORT NO. 4

SURNAME: BROWN  
FIRST NAME: IAN  
ADDRESS1: 17 LEAARD  
ADDRESS2: NORWICH  
TELEPHONE: 011-74381  
AGE: 21

RECORD No. 2

SURNAME: ANDREWS  
FIRST NAME: JAMES  
ADDRESS: 12 ELF ROAD  
ADDRESS: HEREFORD  
TELEPHONE: 021-623451  
AGE: 12

RECORD NO. 2

SURNAME: BROWN  
FIRST NAME: JIM  
ADDRESS1: 5 ELM ROAD  
ADDRESS2: NANTWICH  
TELEPHONE: 081-4580  
AGE: 11

**...and it's all at  
price of just**

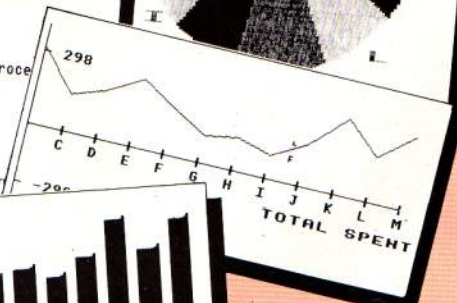
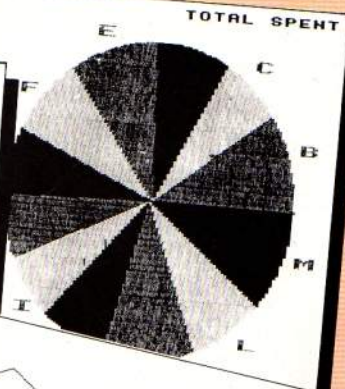


# RN, EASY TO USE

**BBC MODEL 'B'**  
and **ELECTRON**

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
1	100.00	100.00	100.00	100.00	100.00	100.00	600.00
2	100.00	100.00	100.00	100.00	100.00	100.00	600.00
3	100.00	100.00	100.00	100.00	100.00	100.00	600.00
4	100.00	100.00	100.00	100.00	100.00	100.00	600.00
5	100.00	100.00	100.00	100.00	100.00	100.00	600.00
6	100.00	100.00	100.00	100.00	100.00	100.00	600.00
7	100.00	100.00	100.00	100.00	100.00	100.00	600.00
8	100.00	100.00	100.00	100.00	100.00	100.00	600.00
9	100.00	100.00	100.00	100.00	100.00	100.00	600.00
10	100.00	100.00	100.00	100.00	100.00	100.00	600.00
11	100.00	100.00	100.00	100.00	100.00	100.00	600.00
12	100.00	100.00	100.00	100.00	100.00	100.00	600.00
13	100.00	100.00	100.00	100.00	100.00	100.00	600.00
14	100.00	100.00	100.00	100.00	100.00	100.00	600.00
15	100.00	100.00	100.00	100.00	100.00	100.00	600.00
16	100.00	100.00	100.00	100.00	100.00	100.00	600.00
17	100.00	100.00	100.00	100.00	100.00	100.00	600.00
18	100.00	100.00	100.00	100.00	100.00	100.00	600.00
19	100.00	100.00	100.00	100.00	100.00	100.00	600.00
20	100.00	100.00	100.00	100.00	100.00	100.00	600.00
21	100.00	100.00	100.00	100.00	100.00	100.00	600.00
22	100.00	100.00	100.00	100.00	100.00	100.00	600.00
23	100.00	100.00	100.00	100.00	100.00	100.00	600.00
24	100.00	100.00	100.00	100.00	100.00	100.00	600.00
25	100.00	100.00	100.00	100.00	100.00	100.00	600.00
26	100.00	100.00	100.00	100.00	100.00	100.00	600.00
27	100.00	100.00	100.00	100.00	100.00	100.00	600.00
28	100.00	100.00	100.00	100.00	100.00	100.00	600.00
29	100.00	100.00	100.00	100.00	100.00	100.00	600.00
30	100.00	100.00	100.00	100.00	100.00	100.00	600.00
31	100.00	100.00	100.00	100.00	100.00	100.00	600.00
32	100.00	100.00	100.00	100.00	100.00	100.00	600.00
33	100.00	100.00	100.00	100.00	100.00	100.00	600.00
34	100.00	100.00	100.00	100.00	100.00	100.00	600.00
35	100.00	100.00	100.00	100.00	100.00	100.00	600.00
36	100.00	100.00	100.00	100.00	100.00	100.00	600.00
37	100.00	100.00	100.00	100.00	100.00	100.00	600.00
38	100.00	100.00	100.00	100.00	100.00	100.00	600.00
39	100.00	100.00	100.00	100.00	100.00	100.00	600.00
40	100.00	100.00	100.00	100.00	100.00	100.00	600.00
41	100.00	100.00	100.00	100.00	100.00	100.00	600.00
42	100.00	100.00	100.00	100.00	100.00	100.00	600.00
43	100.00	100.00	100.00	100.00	100.00	100.00	600.00
44	100.00	100.00	100.00	100.00	100.00	100.00	600.00
45	100.00	100.00	100.00	100.00	100.00	100.00	600.00
46	100.00	100.00	100.00	100.00	100.00	100.00	600.00
47	100.00	100.00	100.00	100.00	100.00	100.00	600.00
48	100.00	100.00	100.00	100.00	100.00	100.00	600.00
49	100.00	100.00	100.00	100.00	100.00	100.00	600.00
50	100.00	100.00	100.00	100.00	100.00	100.00	600.00
51	100.00	100.00	100.00	100.00	100.00	100.00	600.00
52	100.00	100.00	100.00	100.00	100.00	100.00	600.00
53	100.00	100.00	100.00	100.00	100.00	100.00	600.00
54	100.00	100.00	100.00	100.00	100.00	100.00	600.00
55	100.00	100.00	100.00	100.00	100.00	100.00	600.00
56	100.00	100.00	100.00	100.00	100.00	100.00	600.00
57	100.00	100.00	100.00	100.00	100.00	100.00	600.00
58	100.00	100.00	100.00	100.00	100.00	100.00	600.00
59	100.00	100.00	100.00	100.00	100.00	100.00	600.00
60	100.00	100.00	100.00	100.00	100.00	100.00	600.00
61	100.00	100.00	100.00	100.00	100.00	100.00	600.00
62	100.00	100.00	100.00	100.00	100.00	100.00	600.00
63	100.00	100.00	100.00	100.00	100.00	100.00	600.00
64	100.00	100.00	100.00	100.00	100.00	100.00	600.00
65	100.00	100.00	100.00	100.00	100.00	100.00	600.00
66	100.00	100.00	100.00	100.00	100.00	100.00	600.00
67	100.00	100.00	100.00	100.00	100.00	100.00	600.00
68	100.00	100.00	100.00	100.00	100.00	100.00	600.00
69	100.00	100.00	100.00	100.00	100.00	100.00	600.00
70	100.00	100.00	100.00	100.00	100.00	100.00	600.00
71	100.00	100.00	100.00	100.00	100.00	100.00	600.00
72	100.00	100.00	100.00	100.00	100.00	100.00	600.00
73	100.00	100.00	100.00	100.00	100.00	100.00	600.00
74	100.00	100.00	100.00	100.00	100.00	100.00	600.00
75	100.00	100.00	100.00	100.00	100.00	100.00	600.00
76	100.00	100.00	100.00	100.00	100.00	100.00	600.00
77	100.00	100.00	100.00	100.00	100.00	100.00	600.00
78	100.00	100.00	100.00	100.00	100.00	100.00	600.00
79	100.00	100.00	100.00	100.00	100.00	100.00	600.00
80	100.00	100.00	100.00	100.00	100.00	100.00	600.00
81	100.00	100.00	100.00	100.00	100.00	100.00	600.00
82	100.00	100.00	100.00	100.00	100.00	100.00	600.00
83	100.00	100.00	100.00	100.00	100.00	100.00	600.00
84	100.00	100.00	100.00	100.00	100.00	100.00	600.00
85	100.00	100.00	100.00	100.00	100.00	100.00	600.00
86	100.00	100.00	100.00	100.00	100.00	100.00	600.00
87	100.00	100.00	100.00	100.00	100.00	100.00	600.00
88	100.00	100.00	100.00	100.00	100.00	100.00	600.00
89	100.00	100.00	100.00	100.00	100.00	100.00	600.00
90	100.00	100.00	100.00	100.00	100.00	100.00	600.00
91	100.00	100.00	100.00	100.00	100.00	100.00	600.00
92	100.00	100.00	100.00	100.00	100.00	100.00	600.00
93	100.00	100.00	100.00	100.00	100.00	100.00	600.00
94	100.00	100.00	100.00	100.00	100.00	100.00	600.00
95	100.00	100.00	100.00	100.00	100.00	100.00	600.00
96	100.00	100.00	100.00	100.00	100.00	100.00	600.00
97	100.00	100.00	100.00	100.00	100.00	100.00	600.00
98	100.00	100.00	100.00	100.00	100.00	100.00	600.00
99	100.00	100.00	100.00	100.00	100.00	100.00	600.00
100	100.00	100.00	100.00	100.00	100.00	100.00	600.00

## GRAPHICS



**the unbelievable**  
**£5.95** CASSETTE

**DATABASE SOFTWARE**

Please send me a copy of Mini Office

☐ I enclose my cheque made payable to Database Publications Ltd.

I wish to pay by

☐ Access ☐ Visa No. \_\_\_\_\_

- ☐ Electron cassette £5.95
- ☐ BBC 'B' cassette £5.95
- ☐ BBC 40-track disc £7.95
- ☐ BBC 80-track disc £7.95

Please tick box

Expiry date \_\_\_\_\_

Signed \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

POST TO: Mini-Office Offer, Database Software,  
88 Chester Road, Hazel Grove, Stockport SK7 5NY.

EU9

# DODGE THE

Run the gauntlet of the asteroids as you try to deliver the goods in this nailbiting game by HIMESH SHAH



```
10REM(C)ELECTRON USER
20DIM rowX(7):DIM ast$(3)
)
30PROCinit
40MODES:VDU 23,1,0;0;0
;
50PROCsound
60PROCtitle
70MODE 1:VDU 23,1,0;0;0
0
80PROCintro
90MODE 5:VDU 23,1,0;0;0;
0
100PROCcommands
110PROCrnd_screen
120PROClift_off
130TIME=0
140PROCgame
150END
160DEFPROCrnd_screen
170DIMastX3648
180FOR clearX=astX TO ast
X+3456 STEP 192
190$clearX=STRING$(192,"
")
200NEXT
210COLOUR3:VDU19,3,7,0,0,
0:COLOUR 128:VDU 19,0,0,0,0
,0
220FOR 1eX=2 TO 0 STEP -1
2301epX=1eX+1216
240FOR linX=0 TO 63
2501iX=linX+19
260SOUND 1,1,RND(250),1
270FOR pX=0 TO 18
280posX=(astX+1epX+1iX+pX
)
290IF pX=18 THEN ?posX=13
:80TO 360
300IF ?posX(<)32 THEN 360
```



# ASTEROYD2

IT'S not easy being a space ferry pilot. Not only is deep space far less interesting than it's cracked up to be, it's also full of dangerous asteroids.

The trouble is that you don't have enough money to pay for your passage back to earth. To earn it you've got to run the gauntlet of the asteroids, delivering supplies.

Should you be successful as a cosmic errand boy you can get back to earth, but crash ten times and you get the sack. And as time goes on, things get harder.

As we said at the beginning, it's not easy being a space ferry pilot...

## PROCEDURES

**PROCrand\_screen** Sets up the asteroids in their random positions and stores these locations in memory at *ast%*.

**PROCgame** This is the main procedure, responsible for the flow of the game.

**PROCmove** Responsible for the movements of the ship and checking to see if a bomb is to be dropped.

**PROCcheck** Checks to see if the ship has hit an asteroid or if either end of the screen was reached.

**PROCsmash** Called if you crash. It tells you how many ships you have left and displays an explosion.

**PROCscroll** Creates the moving asteroid effect.

**PROCbomb** If the space bar has been pressed this procedure displays the dropping bomb.

**PROCupdate** After every crossing this procedure tells you how much money you have in the bank and the total number of crossings you have made.

**PROCend.** As you might guess this is called at the end of the game. It tells you how much you've earned.

**PROCinit** Initialises all variables and defines the characters and envelopes.

**PROCwin1** Called on completion of appropriate level.

**PROCwin2** Prints *word\$* at text coordinates *xb%,yb%, size%* characters high.

**PROCwin3** Creates a pause. The larger the value of the parameter *pau%* the longer the pause.

**PROCchiprint** (xb%,yb%,word\$,size%)

**PROCwait(pau%)**

```
310rndX=RND(55-(1eX+10))
320IF rndX>5 THEN 360
330IF rndX=1 AND p1<>17 A
ND 1INX<>63 THEN ?posI=225:
?(posI+1)=226:?(posI+19)=22
7:?(posI+20)=228
340IF rndI=2 OR rndI=3 TH
EN ?posI=224
350IF rndI=4 OR rndI=5 TH
EN ?posI=229
```

```
360NEXT
370PRINT* **$(posX-18)
380NEXT
390NEXT
400eZ=0:lepZ=0
410ENDPROC
420DEFPROCgame
430REPEAT
440PROCmove
450PROCscroll
```

```
460UNTIL FALSE
470ENDPROC
480DEFPROCmove
490IF INKEY(-104)=TRUE AN
D xX(19) THEN xupZ=1
500IF INKEY(-103)=TRUE AN
D xX(20) THEN xupZ=-1
510*FX 15,0
520oxX=xX:xX=xX:xupZ:x
upX=0
```

```
530VDU 31,xX,hiX
540chrX=(USR(&FF4)AND&FF
00)DIV&100
550cZ=(cZMOD2)+1
560COLOUR cZ
570VDU 19,cZ,fcolZ,0,0,0
580*FX 19
590VDU 31,xX,hiX,shZ
```

## From Page 17

```

600VDU 31,ox%,hi%-1,32
610PROCcheck
620SOUND 1,1,100,1
630IF INKEY(-99) THEN PRO
Cboom
640ENDPROC
650DEFPROCcheck
660IF chr%127 AND chr%<1
34 THEN PROCsmash
670IF coll% AND xs%=19 TH
EN st%=19:sh%=231:bomb%=234
:ret%=TRUE:coll%=FALSE
680IF ret% AND xs%=0 THEN
st%:sh%=230:bomb%=235:c
oll%=TRUE:ret%=FALSE:PROCup
date
690ENDPROC
700DEFPROCsmash
710COLOUR 2:VDU 19,2,3,0,
0,0
720SOUND 0,5,4,40
730shipX=ship%-1
740IF ship%=0 THEN 760
750PRINT TAB(1,7):ship%,"
more visits to":PRINT TAB(
1,9):"the repair bay and":P
RINT TAB(4,11):"you're FIRE
D!"
760COLOUR 1
770FOR crashX=1 TO 6
780VDU 19,1,3,0,0,0
790PRINT TAB(xs%,hi%):cra
sh!$
800PROCwait(500)
810VDU 19,1,exc%,0,0,0
820PRINT TAB(xs%,hi%):cra
sh!$
830PROCwait(500)
840NEXT
850IF ship%=0 THEN PROCen
d
860xs=st%
870COLOUR 3
880PROClift_off
890ENDPROC
900DEFPROCscroll
910FX 19
920lin%=(linX+1)MOD64:liX
=linX+19
930COLOUR 3
940PRINT TAB(1,31):astZ+
liX+lep%
950VDU 19,c%,bcol%,0,0,0
960ENDPROC

```

```

970DEFPROCboom
980babX=babX-1
990IF babX<0 THEN babX=0:
ENDPROC
1000IF xs%=0 OR xs%=19 THE
N ENDPROC
1010SOUND 0,1,20,10
1020bcX=(cXMOD2)+1:VDU 19,
bcX,2,0,0,0:COLOUR bcX
1030FX19
1040VDU 31,xs%-1,hi%+1,32,
bombX,32,0,0,0:PROCwait(25)
1050FX19
1060VDU 31,xs%-1,hi%+1,32,
32,32,0,0,0,10,31,xs%-1,hiX
+2,32,bombX,32,0,0,0:PROCwa
it(25)
1070FX19
1080VDU 31,xs%-1,hiX+2,32,
32,32,0,0,0,10,31,xs%-1,hiX
+3,32,bombX,32,0,0,0:PROCwa
it(25):VDU 31,xs%-1,hiX+3,3
2,32,32
1090ENDPROC
1100DEFPROCupdate
1110SOUND 1,2,4,70
1120VDU 19,2,2,0,0,0
1130VDU 31,xs%,hi%,32
1140COLOUR 2
1150crX=crX+1
1160hiX=hiX+1:IF hiX=25 TH
EN hiX=24
1170wageX=RND((11x%+1)*200)
+((11x%+2)+1)*1000-(TIME DIV
50):monX=monX+wageX
1180PRINT TAB(1,5):"No. of
crossings:"crX%
1190COLOUR 1:VDU 19,1,fcoll
%,0,0,0
1200PRINT TAB(1,9)"Bonus f
or trip was"
1210PRINT TAB(8,11):"wag
eX"
1220PRINT TAB(2,13)"You ha
ve "':monX:PRINT TAB(4,15)
"in the Bank."
1230PROCwait(2500)
1240VDU 19,3,7,0,0,0:VDU 1
9,1,fcoll%,0,0,0
1250COLOUR 3
1260IF monX>10000 AND leX=
0 THEN PROCwin1
1270IF monX>50000 AND leX=
1 THEN PROCwin2
1280IF monX>50000 AND leX=
2 THEN PROCwin3
1290TIME=0:PROClift_off

```

```

1300ENDPROC
1310DEFPROCtitle
1320COLOUR 128:COLOUR 2:VD
U 19,2,4,0,0,0:VDU 19,0,7,0
,0,0:CLS:SOUND 0,5,15,970
1330PROCprint(5,0,"Aster
oydz",5)
1340COLOUR 1:PROCwait(1000
)
1350PROCprint(6,15,"by",
2):PROCprint(17,18,"Hiaesh
Shah",2)
1360PROCwait(4500)
1370VDU 19,2,0,0,0,0:VDU 1
9,0,0,0,0,0:VDU 19,3,7,0,0,0:
COLOUR 3:VDU 19,1,0,0,0,0
1380VDUS:FOR nX=1 TO 40:MO
VERND(1100),RND(900):PRINTa
st%:(RND(3)):SOUND 1,1,RND(2
50),5:NEXT:VDU 4
1390PROCwait(5000)
1400ENDPROC
1410DEFPROCsound
1420COLOUR 3:COLOUR128:VDU
19,0,4,0,0,0
1430PROCprint(4,12,"Do
you want",2):PROCprint(5
,15,"sound...y/n",2)
1440REPEAT
1450IF INKEY(-69) THEN PRO
Csound:ENDPROC
1460IF INKEY(-86) THEN PRO
Csoundoff:ENDPROC
1470UNTIL FALSE
1480ENDPROC
1490DEFPROCsoundon
1500FX210,0
1510ENDPROC
1520DEFPROCsoundoff
1530FX210,1
1540ENDPROC
1550DEFPROCintro
1560VDU 19,3,7,0,0,0:VDU 1
9,1,1,0,0,0:COLOUR 1:COLOUR
131
1570CLS:PROCprint(10,5,"
your predicament....",2)
1580VDU 19,2,4,0,0,0:COLOU
R 2
1590PRINT TAB(2,10)" Boy,
do you have problems! You
are stranded on the plane
t Rockz, a barren inhospit
able planet, that is for
all but a small supply bas
e."
1600PRINT TAB(2,16)" Being

```

```

extremely bored and home
sick, you want to return to
your home-planet, Earth. F
ortunately there is a mon
thly Rockzz-Earth shuttle.
Tickets are only '10,000..
..shame you've only got 10p.
"
1610PRINT TAB(5,30)"Press
SPACE BAR"
1620REPEAT UNTIL INKEY(-99
)
1630VDU 28,0,31,39,8:CLS
1640PRINT TAB(2,2)" Fortun
ately you've just got your
self a job as a supply sh
uttle pilot, your job bein
g to ferry supplies to st
ar- ships anchored in orbit
."
1650PRINT TAB(2,0)" Simple
huh? I'm afraid not. Un
fortunately between you a
nd the ships lies a dense b
elt of asteroids."
1660PRINT TAB(5,22)"Press
SPACE BAR"
1670REPEAT UNTIL INKEY(-99
)
1680CLS
1690PRINT TAB(2,2)" If you
collide with an asteroid
you must return to the re
pair base immediatly. I
f you crash more than 10 ti
mes in level 1, you get the
sack. Each time you go up
a level, five bonus 'live
s' are given."
1700PRINT TAB(2,10)" To he
lp you with your task you
are given 10 bombs and y
ou get 10 more each time y
ou go up a level. As you prog
ress through the levels t
he asteroid belt gets dens
er. If you complete all th
ree levels...you win!"
1710PRINT TAB(5,22)"Press
SPACE BAR"
1720REPEAT UNTIL INKEY(-99
)
1730ENDPROC
1740DEFPROCcommands
1750COLOUR1:CLS:PROCchirp
t(6,5,"Controls",2)
1760COLOUR2:PRINT TAB(3,10

```





```

)<.....move left"
1770PRINT TAB(3,14)">....
move right"
1780PRINT TAB(1,10)"space.
..drop a bomb"
1790PRINT TAB(3,20)"Press
SPACE BAR"
1800REPEAT UNTIL INKEY(-99
)
1810ENDPROC
1820DEFPROCend
1830CLS:SOUND 0,3,150,30:S
OUND 0,3,10,20
1840PRINT TAB(3,4)"The bos
s wasn't"
1850PRINT TAB(3,6)"too ha
ppy with"
1860PRINT TAB(3,8)" your
work "
1870PRINT TAB(3,11)" YOU'R
E FIRED!"
1880PRINT TAB(1,14)"Howeve
r you earned"
1890PRINT TAB(8,16)"":mon
%ext%
1900PRINT TAB(2,19)"press
SPACE BAR"
1910REPEAT UNTIL INKEY(-99
)
1920PROCAnother_go
1930ENDPROC
1940DEFPROCinit
1950mon%:=0:cr%:=0:hi%:=16:bc
ol%:=0:col%:=1:exc%:=1:bb%:=1
0:le%:=0:lep%:=0
1960sh%:=230:coll%:=TRUE:ret
%:=FALSE:st%:=0
1970VDU 23,224,0,20,126,25
5,127,156,126,12
1980c%:=3:ship%:=0:xs%:=0:yu
p%:=0:lin%:=0:le%:=0
1990VDU 23,225,0,7,31,63,6
3,127,223,223
2000VDU 23,226,0,224,136,1
24,252,254,254,223
2010VDU 23,227,159,63,127,
63,60,9,3,6
2020VDU 23,228,159,127,246
,248,252,240,224,0
2030VDU 23,229,0,0,32,112,
120,40,0,0
2040VDU 23,230,0,192,112,5
6,63,56,112,192
2050VDU 23,231,0,3,14,20,2
52,20,14,3
2060VDU 23,232,0,42,8,99,8
,42,0,0

```

```

2070VDU 23,233,73,42,0,65,
0,42,73,0
2080VDU 19,0,0,0,0,0
2090crash%:=CHR$(232):cras
h%:=CHR$(233)
2100ast%(1)=CHR$(224):ast%(
2)=CHR$(225)+CHR$(226)+CHR
$(8)+CHR$(9)+CHR$(10)+CHR$(
227)+CHR$(228):ast%(3)=CHR$(
229)
2110VDU 23,234,1,59,120,25
5,255,120,59,1
2120VDU 23,235,120,220,30,
255,255,30,220,120:bomb%:=23
5
2130TIME=0
2140le%:=0:lep%:=0:ext%:=0
2150ENVELOPE 1,1,50,-100,5
0,1,1,1,126,0,0,-126,126,12
6
2160ENVELOPE 5,6,2,20,16,1
6,0,0,126,0,0,-126,126,126
2170ENVELOPE 2,2,6,0,0,255
,0,0,126,0,0,-126,126,126
2180ENDPROC
2190DEFPROCwin1
2200SOUND 1,5,100,100
2210CLS:COLOUR 2
2220PRINT TAB(2,7)"Well do
ne! You've"
2230PRINT TAB(1,9)" earne
d '10,000"
2240PRINT TAB(1,11)" How
ever, with"
2250PRINT TAB(1,13)"inflat
ion as it is"
2260PRINT TAB(0,15)"the ti
cket now costs"
2270PRINT TAB(1,17)"
'50,000"
2280COLOUR1
2290PRINT TAB(4,27)"press
SPACE BAR"
2300REPEAT UNTIL INKEY(-99
)
2310COLOUR 3
2320col%:=3:bc%:=4:exc%:=1
:VDU 19,0,4,0,0,0

```

```

2330le%:=1:lep%:=1216:bb%:=b
ab%:=10:hi%:=16:ship%:=ship%+5
2340PROClift_off
2350ENDPROC
2360DEFPROCwin2
2370CLS:COLOUR 2
2380SOUND 1,5,80,80
2390PRINT TAB(1,7)"Unfortu
nately the"
2400PRINT TAB(1,9)"Bank of
Rockz has"
2410PRINT TAB(1,11)"collap
sed, and has"
2420PRINT TAB(1,13)" taken
your hard"
2430PRINT TAB(0,15)"earned
cash with it!"
2440PRINT TAB(0,17)"Anothe
r '50,000 and"
2450PRINT TAB(1,19)" you'r
e homeward"
2460PRINT TAB(1,21)"
bound"
2470COLOUR 1
2480PRINT TAB(4,25)"press
SPACE BAR"
2490REPEAT UNTIL INKEY(-99
)
2500COLOUR3
2510col%:=0:bc%:=1:exc%:=4
:VDU 19,0,1,0,0,0
2520ext%:=mon%+le%:=2:lep%:=2
432:mon%:=0:hi%:=16:bb%:=bb%+
10:ship%:=ship%+5
2530PROClift_off
2540ENDPROC
2550DEFPROCwin3
2560COLOUR2:VDU 19,2,3,0,0
,0
2570SOUND 1,5,150,120
2580CLS:PRINT TAB(5,7)"Wel
l done!"
2590PRINT TAB(2,9)" Altoget
her you"
2600PRINT TAB(3,11)"earned
'":mon%+ext%
2610PRINT TAB(3,13)"in 'jc
r%," crossings"

```

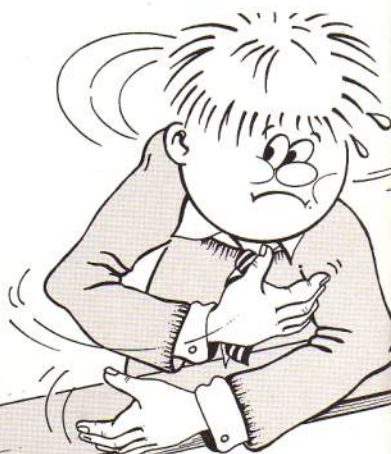
```

2620PRINT TAB(2,15)"Enjoy
your flight"
2630PRINT TAB(3,17)" h
ome"
2640PRINT TAB(5,27)"press
SPACE BAR"
2650REPEAT UNTIL INKEY(-99
)
2660PROCAnother_go
2670ENDPROC
2680DEFPROCAnother_go
2690CLS:PROCchiprint(2,10,"
Another go...y/n",2)
2700REPEAT
2710IF INKEY(-86) THEN END
2720UNTIL INKEY(-69)
2730PROCinit
2740COLOUR 3
2750VDU 19,3,7,0,0,0
2760PROClift_off
2770PROCgame
2780ENDPROC
2790DEFPROClift_off
2800FOR lin%:=0 TO 60:PRINT
" *$(ast%+(lin%+19)+lep%):
SOUND 1,1,lin%+3.5,1:NEXT:1
in%:=lin%-1
2810ENDPROC
2820DEFPROCchiprint(xb%,yb%,
word%,size%)
2830FOR let%:=1 TO LENword%
2840ch%:=0:col%:=1:r%:=let%
=MID$(word%,let%,1)
2850AX:=0:YX:=0:YX:=0:YX:=0
0:ASC(let%):CALL $FFFI
2860REPEAT
2870col%:=col%+1:r%:=col%MOD8:r
ow%:=col%MOD8)=?(&71+col%divs
ize%)
2880IF r%>7 THEN ch%:=ch%+1
:VDU 23,236,row%(0),row%(1)
,row%(2),row%(3),row%(4),ro
w%(5),row%(6),row%(7):PRINT
TAB(xb%+let%-1,yb%+ch%-1)C
HR$(236)
2890UNTIL ch%:=size%
2900AX:=135
2910NEXT
2920ENDPROC
2930DEFPROCwait(pau%)
2940FOR w%:=1 TO pau%:NEXT
2950ENDPROC

```

*This listing is included in this month's cassette tape offer. See order form on Page 61.*

# The moving story of a pint of beer!



**IN the first part of this series we looked at how the screen memory was organised. Now we are going to try a few short and simple machine code routines to print a multi-coloured character on the screen.**

You'll remember that the Mode 5 screen is composed of 32 rows and that each row has 40 columns.

Each column is eight bytes deep in memory, a single character occupying 16 bytes of memory, being made up of two columns of eight bytes.

We saw how the bit pattern

of each byte in the screen memory holds the information for four horizontal pixels.

To display a character on the screen, all that is necessary is to work out the data required and store it in two columns of eight bytes somewhere between &5800 and &8000. This is the section of memory that holds the Mode 5 screen display.

Program 1 displays a character by storing the 16 bytes of data in the screen memory. Lines 30 to 60 read the data and store it temporarily in page &C.

This area of memory is reserved for character definitions, so, as we aren't defining any, it'll be free for us to use. Lines 90 to 140 contain the

machine code. This is a simple loop which collects each item of data from page &C and stores it starting at &64C8, which is somewhere near the middle of the screen.

Indexed addressing is used to collect and store the data.

The actual character is a pint of beer - no particular reason, it just happened to be the first thing that came to mind as I was writing this.

The data statements were created using a sprite definier which will be listed later in the series.

Alternatively, you could define the character, print it in

the top left corner of the screen and print out the contents of the first 16 bytes of screen RAM to get the required data.

It's difficult to get any idea of the fantastic speed advantage over Basic by printing a single character, so Program 11 completely fills the screen with pints of beer. Considering it's made up of three colours, it's incredibly fast.

There aren't any variables in machine code, so the routine uses memory locations &70/71 to store the address it's printing at.

This is initially set at &5800. Line 140 collects the data and 150 stores it in the screen RAM using post-

```

10 REM PROGRAM I
20 MODE 5
30 FOR byte=0 TO 15
40 READ data
50 byte=&C00+data
60 NEXT
70 PX=&900
80 C OPT 2
90 LDY #15
100 .loop
110 LDA &C00,Y
120 STA &64C8,Y
130 DEY

```

Program 1

```

10 REM PROGRAM 11
20 MODE 5
30 FOR byte=0 TO 15
40 READ data
50 byte=&C00+data
60 NEXT
70 PX=&900
80 C OPT 2
90 LDA &000,STA &70
100 LDA &450,STA &71
110 .loop1
120 LDY #15
130 .loop2
140 LDA &C00,Y
150 STA (&70),Y
160 DEY
170 BPL loop2
180 CLC
190 LDA &70:ADC #16:STA &70
200 LDA &71:ADC #00:STA &71
210 CMP #600
220 BNE loop1
230 RTS
240 J
250 PRINT "Press a key";
260 REPEAT UNTIL GET
270 CALL &900
280 REM Beer
290 DATA 136,246,143,143,
143,143
300 DATA 143,119,136,170,
221,153
310 DATA 221,170,136,0

```

Program 11



## Part Two of ROLAND WADDILOVE's series on programming graphics with arcade games in mind

indexed indirect addressing.

Lines 180 to 210 increment the address at &70/&71 by 16 (as each character is 16 bytes wide). When the high byte is equal to &80 then the loop is finished.

As we saw last month, the start address of each line on the screen going down is &140 higher than the previous line and each character is &10 bytes wide.

So to print a multicoloured character at TAB(x,y) the address is &5800+&10\*x+&140\*y. I'm assuming that you haven't scrolled the screen at any time.

How can we make our character move? In Program II we printed it at successive character positions until the screen was full. If we delete

the previous character before printing the next, then we'll have our moving pint of beer.

Program III moves our character while a key is held down. When it reaches the end of a line it moves on to the start of the next.

It doesn't check when it goes off the bottom of the screen, so you'll have to press Escape to end.

As before, the address it's printing at is stored in &70/&71. First the old character is deleted by storing zeros in the screen memory, lines 80-130.

Then the address is incremented by 8, lines 140-160, and the character printed at the new address, lines 170-220.

The movement of the character when you tap a key appears to be almost instantaneous, with no flicker at all. If

you hold down a key the pint moves so fast it starts to blur.

An important point to notice is that the background is erased when the character passes over it. This isn't very sprite-like is it? Still it's surprising how many games have a plain black background.

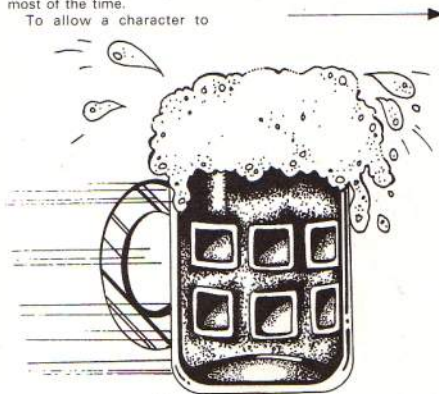
Simply deleting the character by storing zeros in the memory is quite acceptable most of the time.

To allow a character to

move over the background or any other character, what we do is to Exclusively OR the character data with the data in the screen memory. EORing once prints the character and EORing again removes it.

To see the EOR function in action, run Program IV. When a key is pressed the character data is EORed with the screen. It alternately prints and erases it.

Line 120 gets the character data, 130 EORs it with the



```

10 REM PROGRAM III
20 FOR byte=0 TO 15
30 READ data
40 byte=&C00+data
50 NEXT
60 P1=&900
70 C OPT 2
80 LDY #15
90 LDA #0
100 .loop1
110 STA (&70),Y
120 DEY
130 BPL loop1
140 CLC
150 LDA &70:ADC #8:STA &7
143,143
160 LDA &71:ADC #0:STA &7
221,153
170 LDY #15
180 .loop1
190 LDA &C00,Y
200 STA (&70),Y
210 DEY
220 BPL loop1
230 RTS
240 J
250 MODE 5
260 VDU 23,1,0;0;0;0;
270 :&70=&5940
280 PRINT "Press a key"
290 REPEAT
300 CALL &900
310 UNTIL GET=0
320 REM Beer
330 DATA 136,248,143,143,
143,143
340 DATA 143,119,136,170,
221,153
350 DATA 221,170,136,0

```

Program III

```

10 REM PROGRAM IV
20 MODE 5
30 VDU 23,1,0;0;0;0;
40 FOR byte=0 TO 15
50 READ data
60 byte=&C00+data
70 NEXT
80 P1=&900
90 C OPT 2
100 LDY #15
110 .loop
120 LDA &C00,Y
130 EOR &64C8,Y
140 STA &64C8,Y
150 DEY
160 BPL loop
170 RTS
180 J
190 PRINT "Press a key"
200 REPEAT
210 CALL &900
220 UNTIL GET=0
230 REM Beer
240 DATA 136,248,143,143,
143,143
250 DATA 143,119,136,170,
221,153
260 DATA 221,170,136,0

```

Program IV



**SLOGGER**

# ROMBOX



## WOULD YOU LIKE TO RUN BBC ROM SOFTWARE?

**THEN FIT THE SLOGGER ROMBOX AND YOU WILL INSTANTLY BE ABLE TO USE BBC ROM SOFTWARE**

- ★ All good now mode 7 BBC ROM software will run without modification
- ★ Fully compatible with Plus 1 and Plus 3
- ★ Supports 8K and 16K RAM
- ★ Allows further expansion at rear

**ONLY £44.95**

(Note: Electron has no mode 7)

### STARWORD (16K ROM)

**A Word Processor for ONLY £34.50**

- ★ Does everything VIEW does plus MUCH MORE!
- ★ Designed for the home user, education or small business needs, STARWORD enables even those with limited typing skills to produce and print letters, manuals or reports using the Electron.
- ★ All standard Word Processing facilities.
- ★ Maximum 132 columns of text.
- ★ Sophisticated print facilities... defaults to EPSON compatible printers.
- ★ Personalised letters.
- ★ Easy to use.
- ★ Fully cross-referenced comprehensive user manual.

### \*\* Latest Product \*\* STARSTORE ON ROM

Store and retrieve your names and addresses or any other information with the **STARSTORE DATABASE**, written specifically for the Electron, STARSTORE works with STARWORD for personalising standard letters (mailmerging).

- ★ For both tape and disc users.
- ★ Fully cross referenced comprehensive user manual.

**ONLY £29.95**

### STARMON

The STARMON ROM is an invaluable tool for those who wish to debug, manipulate, control or study machine code programs.

- ★ Display of memory in: Ascii and binary, decimal, octal or hexadecimal.
- ★ Full support of sideways ROMs.
- ★ Comprehensive debugging facilities, including breakpoints, traces and events.
- ★ "a very professional piece of firmware" ... Acorn User.

**ONLY £22.50**

### ELKMAN

The most powerful ROM Manager on the BBC is now available for the Electron.

- ★ Disable troublesome ROMs, even on a control-Break!
- ★ Full support of sideways RAM.
- ★ Supports function key editing etc.
- ★ Display ROM titles, sizes etc.
- ★ Peek, Poke and Disassemble ROM and RAM.
- ★ Reference ROM by title or page number.

**ONLY £17.50**

### STARWORD for Printer Driver Generator

The printer driver generator program allows you to create your own printer drivers to personalise your printer characteristics.

- ★ Easy to use... no special knowledge required.
- ★ Complete with comprehensive user manual.

Supplied on cassette, **PRICE £7.95**

*All prices include VAT P&P UK and Mainland only*

**SEND  
FOR  
THEM  
TODAY**

Cheques payable to:  
**SLOGGER LTD.**

☐ Access No. ....

☐ Visa .....

Name .....

Address .....

Signed ..... Tel. No. ....

Send Orders to: **SLOGGER LTD.**  
215 BEACON ROAD, CHATHAM, KENT.

ROMBOX (standard)	£44.95
ROMBOX (with printer interface)	£69.95
STARWORD	£34.50
STARSTORE	£29.95
PRINTER DRIVER GENERATOR	£7.95
STARMON	£22.50
ELKMAN	£17.50
8K STATIC RAM CHIPS	P.O.A.
16K SIDEWAYS RAM BOARD	P.O.A.

**DEALER ENQUIRIES WELCOME. TEL: 0634 811634/41622**



HEX BINARY

Byte	HEX	Binary
Byte 1:	&37	0 0 1 1 0 1 1 1
Byte 2:	&AC	1 0 1 0 1 1 0 0
EOR :	&9B	1 0 0 1 1 0 1 1

Press 1 or 2 to change bytes  
Press 0 to zero

Program V in action

## From Page 21

screen and 140 stores the result back in the screen memory. How does this work?

Program V shows exactly what the EOR function does. Two bytes are displayed in hex and binary and the EOR result displayed below.

The result is calculated by comparing each bit of the two

bytes according to the following rules:

0	EOR	0	is	0
1	EOR	0	is	1
0	EOR	1	is	1
1	EOR	1	is	0

Suppose that the data for the background is &0F and the character data is &AA. When we EOR them to print the

```

10 REM PROGRAM V
20 REN R.A.Waddilove
30 ON ERROR IF ERR<17 R
EPORT:PRINT" at line ";ERL:
END
40 MODE 1:VDU 23,1,0;0;0
;0;
50 DRAW 0,1023:DRAW 1276
,1023:DRAW 1276,0:DRAW 0,0
60 PRINT TAB(3,12)"Byte
1:";TAB(3,14)"Byte 2:";TAB(
4,17)"EOR :";TAB(12,9)"HEX
";TAB(24,9)"Binary"
70 COLOUR 129:PRINT TAB(
9,3)" EORING Two Bytes..."
80 COLOUR 0:PRINT TAB(5,
25)" Press 1 or 2 to change
bytes ";TAB(11,27)" ESCAPE
to zero ";COLOUR 120
90 COLOUR 128
100 byte1:=0:byte2:=0
110 PROCdata(12,byte1)
120 PROCdata(14,byte2)
130 REPEAT
140 KX=INKEY#:#FX21,0
150 PROCdata(17,byte1) EO
R byte2)
160 IF KX=49 byte1X=(byte
1X+1)MOD256:PROCdata(12,byt
e1)
170 IF KX=50 byte2X=(byte
2X+1)MOD256:PROCdata(14,byt
e2)
180 UNTIL FALSE
190 END
200 DEF PROCdata(YX,NX)
210 COLOUR 2
220 IF NX<16 PRINT TAB(12
,YX)"&";NX;SPC(5); ELSE P
RINT TAB(12,YX)"&";NX;SPC(
5);
230 COLOUR 1:FOR I=1 TO 5
0:NEXT
240 IF INKEY=49 OR INKEY=
50 ENDPROC
250 FOR IX=7 TO 0 STEP -1
260 IF NX AND 2*IX PRINT"
1 "; ELSE PRINT"0 ";
270 NEXT
280 ENDP

```

Program V

```

10 REM PROGRAM VI
20 MODE 5
30 VDU 23,1,0;0;0;0;
40 FOR byte=0 TO 15
50 READ data
60 byte:=C000+data
70 NEXT
80 old:=470:new:=472
90 PX=4900
100 [ OPT 2
110 LDX #2
120 .loop1
130 LDY #15
140 .loop2
150 LDA &C00,Y
160 EOR (old),Y
170 STA (old),Y
180 DEY
190 BPL loop2
200 LDA new:STA old
210 LDA new+1:STA old+1
220 DEX
230 BNE loop1
240 CLC
250 LDA new:ADC #0:STA ne
w
260 LDA new+1:ADC #0:STA
new+1
270 RTS
280 ]
290 !old:=old+1:new:=new+1
300 PRINT""Press a key"
310 REPEAT
320 CALL 4900
330 UNTIL GET=0
340 REM Beer
350 DATA 136,248,143,143,
143,143
360 DATA 143,119,136,170,
221,153
370 DATA 221,170,136,0

```

Program VI

character we get &A5. Try it with Program V.

If &A5 is EORed again we end up with &0F again.

This means that by EORing the data with the screen the background isn't wiped out. It may be temporarily messed up, but when the character moves off it the background is restored.

In Mode 5 there's not much we can do about the weird effect when two characters meet.

However, in Mode 2 it's possible to arrange the colours using VDU 19 so that one character moves over the other while retaining its shape and colour. I'll leave this to you to work out if you're interested.

Program VI does exactly the same as Program II but using the EOR method to print the character. Notice the difference. The prompt is not erased when the pint passes over it. This can be an extremely useful technique.

The program uses two variables, *old* and *new* to store the old address of the character and the new address. It EORs the character data with the screen at *old* and then at *new*. *new* is then incremented by 8 ready for the next time round the loop.

And that's it for this month. Next time we'll be exploring ways of controlling our machine code characters.

Yes, cursor controlled pints come to the Electron!



Organised by  
The Micro User  
and Electron User

# It's back! The user-friendly show

## On public display for the first time!

Here's your chance to have hands-on experience of the most talked-about communications development of 1985

### MicroLink

in association with

### TELECOM GOLD

The unique service that has brought big-business electronic mail down to a price every micro owner can afford.

*Find out for yourself why it's such an outstanding success!*



## UMIST, Manchester

Only five minutes from



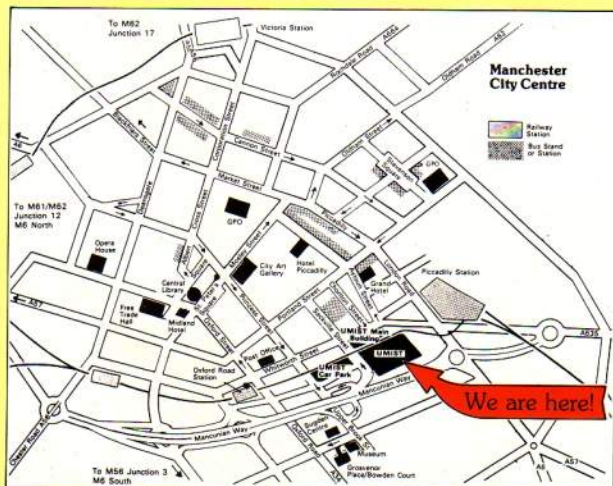
Manchester  
Piccadilly

### SAVE MONEY!

... with our special  
rail travel offer

Arrangements have been made for discounted rail travel tickets to be made available to all visitors to the show.

For full details write to:  
Travel Offer, PO Box 1, St Albans AL1 4ED, sending a stamped addressed envelope. Or phone 0727-34475. Please quote the Electron & BBC Micro User Show.



**First exhibitors to book stands are:** AMX, Alphadisk, Altra Roms, Blue Ribbon, Care Electronics, Gemini, IDS, LCL, Micro Aid, Miniature Tool Company, Norwich Computer Services, Opus Supplies, System, Viglen, Micro Aids, Holly, National Micro Centres, Watford Electronics, Kansas City Systems, Shards, Pace Micro Technology, Modem House, Miracle Technology, Micronet, Direct Disk.



# most of all!

...And  
with more  
**GENUINE**  
bargains  
than ever before!

All the big manufacturers and dealers are gearing themselves up for the big pre-Christmas selling period. So that means visitors to the September Show will enjoy the best of both worlds – a first look at all the fascinating new-season products **PLUS** a chance to pick up some really worthwhile bargains as old stock is sold at rock-bottom prices.

## Reduced prices for School/ College Groups

Entry only £1 per student if bookings are made in advance. Send your cheque (made payable to Database Publications) and SAE to:

Electron & BBC Micro User Show  
68 Chester Road, Hazel Grove  
Stockport SK7 5NY.  
Tel: 061 480 7863

Valid for a minimum of 10 people

## THEY'LL ALL BE THERE!

Come and meet the people whose names you see regularly in the news pages of this magazine – the people who've helped both the BBC Micro and Electron evolve into the truly versatile computers they are today. They'll all be there on their stands, willing to give you help and advice. So too will be our writers and programmers. They will also be delighted to talk to you and give you the benefit of their experience.



This  
voucher is worth  
**50p per head!**



By handing in this voucher at the door you save 50p off the normal admission price of £2 (adults) and £1.50 (children).  
(Valid for a maximum of 4 people)

10am-6pm, Friday, 27 September  
10am-6pm, Saturday, 28 September  
10am-4pm, Sunday, 29 September

**Renold Building, UMIST, Manchester.**

Number attending:  1  2  3  4

EUS

# 21st. Software (BBC VERSIONS AVAILABLE)

PRESENTS A SELECTION OF HARDWARE, UTILITIES & SOFTWARE FOR THE ELECTRON

## OPERATION CARETAKER

Complete Care - Cleaning Kit  
Consists:  
Cleaning & De-magnetising  
Tape, Tape to correct Azimuth  
alignment. Special screwdriver  
to adjust head alignment.  
R.R.P. £10.95 OUR PRICE £9.95

## FIRST BYTE PRINTER INTERFACE CENTRONICS PARALLEL (No Software Req.)

R.R.P. £34.95 OUR PRICE £31.95

## SUPER 3 PACK SUPERIOR SOFTWARE GAMES

- 2 Cassettes consists of:-  
1. STRANDED (Graphic Adventure)  
2. FRUIT MACHINE (Save money play this!)  
3. INVADERS (Classic Arcade Game)  
ALL 3 FOR JUST £5.95 incl.

## SLOGGER SOFTWARE ROMS

ELKMAN R.R.P. £17.50  
OUR PRICE £15.75  
STARMON (machine code  
monitor) R.R.P. £22.50  
OUR PRICE £20.25

## PLUS3 SOFTWARE ACORN SOFTWARE GAMES DISC

(Contains: Maze, Firebug & Planetsoids)  
R.R.P. £19.75 OUR PRICE £17.95  
Database R.R.P. £19.75 OUR PRICE £17.95

## NEW! EDGE COMPUTERS

MICRO GO  
(Traditional Board Game)  
R.R.P. £9.95 OUR PRICE £8.95

## POWERSOFT ROM JOYSTICK INTERFACE

R.R.P. £24.95 OUR PRICE £22.65

	R.R.P.	OUR PRICE		R.R.P.	OUR PRICE		R.R.P.	OUR PRICE
<b>A/N/F</b>			<b>Gert</b>	7.95	6.95	<b>Space Shuttle</b>	8.00	7.00
<b>Bargain Pack</b>	14.95	12.95	<b>D.A.C.C.</b>			<b>MP SOFTWARE</b>		
<b>AARDVAAK</b>			<b>Fight Sim 747 (DACC)</b>	9.95	8.95	<b>Valley Castle</b>	7.50	6.50
<b>Zelda</b>	6.95	5.95	<b>Sprite Generator</b>	9.95	8.95	<b>Valley of the Kings</b>	7.50	6.50
<b>ACORN'SOFT</b>			<b>DURELL MANTECH</b>			<b>Frisen Wood</b>	7.50	6.50
<b>Elite</b>	12.95	11.65	<b>Brian Jacks Superstars</b>	7.95	6.95	<b>Woodland Terror</b>	7.50	6.50
<b>Magic Mushrooms</b>	11.95	10.95	<b>Combat Lynx</b>	8.95	7.95	<b>Blue Dragon</b>	7.50	6.50
<b>Snooker</b>	6.99	5.99	<b>Endless Jump</b>	7.95	6.95	<b>Survivor</b>	7.50	6.50
<b>Sophya Adventure</b>	6.99	5.99	<b>Gilbourne's Castle</b>	7.95	6.95	<b>MICROPOWER</b>		
<b>Strategic Command</b>	6.99	5.99	<b>ENGLISH SOFTWARE</b>			<b>Ghost</b>	7.95	6.95
<b>Arcadians</b>	6.99	5.99	<b>Speaceman Sid</b>	7.95	6.95	<b>Jet Power Jack</b>	6.95	5.95
<b>Free Fall</b>	6.99	5.99	<b>Jet Boot Jack</b>	7.95	6.95	<b>Positron</b>	6.95	5.95
<b>Meteors</b>	6.99	5.99	<b>Kissin Cousins</b>	4.95	4.25	<b>Swag</b>	6.95	5.95
<b>Maze</b>	6.99	5.99	<b>EPIC SOFTWARE</b>			<b>Gauntlet</b>	6.95	5.95
<b>Boxer</b>	6.99	5.99	<b>The Wheel of Fortune</b>	9.95	8.45	<b>Chess</b>	7.95	6.95
<b>Philosophers Quest</b>	6.99	5.99	<b>Castle Frankenstein</b>	7.95	6.55	<b>Killer Gorilla</b>	7.95	6.95
<b>Hopper</b>	6.99	5.99	<b>The Quest of the Holy Grail</b>	7.95	6.55	<b>Moonrider</b>	7.95	6.95
<b>Firebug</b>	6.99	5.99	<b>Kingdom of Klein</b>	7.95	6.55	<b>U.X.B.</b>	7.95	6.95
<b>North</b>	16.85	15.35	<b>GOLLEN LTD</b>			<b>Felix &amp; Evil Weevils</b>	6.95	5.95
<b>Lisp</b>	16.85	15.35	<b>Education 1</b>	8.00	7.00	<b>Felix in Factory</b>	7.95	6.95
<b>Personal Money Management</b>	6.99	5.99	<b>Education II</b>	8.00	7.00	<b>Felix &amp; Fruit Monsters</b>	7.95	6.95
<b>Tree of Knowledge</b>	6.99	5.99	<b>Fun with Words</b>	8.00	7.00	<b>Galactic Commander</b>	7.95	6.95
<b>View Rom Cartridge</b>	29.99	27.65	<b>Fun with Numbers</b>	8.00	7.00	<b>Cybertron</b>	7.95	6.95
<b>Viewhead Rom Cartridge</b>	29.99	27.65	<b>Jigsaw</b>	8.00	7.00	<b>MIRRORSOFT</b>		
<b>ACORN'SOFT/BES</b>			<b>HEWSON</b>	7.95	6.95	<b>Star Trek</b>	9.95	8.95
<b>Happy Letters</b>	8.95	7.95	<b>Headhute A.T.C.</b>			<b>Count with Oliver</b>	7.95	6.95
<b>Timaman One</b>	8.95	7.95	<b>HIGHLIGHT SOFT!</b>			<b>Look Sharp</b>	7.95	6.95
<b>Happy Numbers</b>	8.95	7.95	<b>Reading Pack 1</b>	7.95	6.95	<b>First Steps</b>	8.95	7.95
<b>Wordhang</b>	8.95	7.95	<b>Reading Pack II</b>	7.95	6.95	<b>Here There with Mr. Men</b>	7.95	6.95
<b>Diary</b>	9.95	8.95	<b>Reading Pack 3</b>	7.95	6.95	<b>Ocean</b>	6.90	5.90
<b>ACORN/LINKWORD</b>			<b>Reading Pack 4</b>	7.95	6.95	<b>Hunchback</b>		
<b>German</b>	14.95	12.95	<b>HOLLY SOFTWARE</b>			<b>QUALSOFT</b>		
<b>French</b>	14.95	12.95	<b>GameMaker Mode 2</b>	12.00	10.65	<b>Soccer Supremo</b>	9.95	8.95
<b>Italian</b>	14.95	12.95	<b>GameMaker Mode 5</b>	12.00	10.65	<b>SALAMANDER</b>		
<b>Spanish</b>	14.95	12.95	<b>ICON SOFTWARE</b>			<b>737 Flight Sim</b>	8.95	8.95
<b>ACORN/BERG</b>			<b>Caveman Capers</b>	7.95	6.95	<b>Graphics System</b>	9.95	8.95
<b>Theatre Quiz</b>	12.95	11.75	<b>Drain Mania</b>	7.95	6.95	<b>SHARDS</b>		
<b>Royal Quiz</b>	12.95	11.75	<b>Bug Eyes</b>	7.95	6.95	<b>Empire</b>	6.95	5.95
<b>Science Fiction Quiz</b>	12.95	11.75	<b>Zorak the Conqueror</b>	7.95	6.95	<b>Pettigrews Diary</b>	7.95	6.95
<b>ADDICTIVE GAMES</b>			<b>Warpi</b>	6.95	5.95	<b>Mystery of Jiva Star</b>	7.95	6.95
<b>Football Manager</b>	7.95	6.95	<b>Ultrom</b>	7.95	6.95	<b>Galilee</b>	6.95	5.95
<b>ADVENTURE INT:</b>			<b>Wrongo</b>	7.95	6.95	<b>SOFTWARE INVASION</b>		
<b>Gremling</b>	7.95	6.95	<b>INCEPTE</b>			<b>3D Bomb Alley</b>	7.95	6.95
<b>The Hulk</b>	7.95	6.95	<b>Millicon</b>	6.50	5.50	<b>Gunsplode</b>	7.95	6.95
<b>Spideman</b>	7.95	6.95	<b>Confuzion</b>	6.95	5.95	<b>Blitzkrieg</b>	7.95	6.95
<b>Adventureland</b>	7.95	6.95	<b>INTERCEPTOR</b>			<b>Super Pool</b>	7.95	6.95
<b>The Count</b>	7.95	6.95	<b>Tales Arabian/Knights</b>	6.00	5.00	<b>Vortex</b>	7.95	6.95
<b>Mystery Funhouse</b>	7.95	6.95	<b>KOSMOS SOFTWARE</b>			<b>SLOGGER</b>		
<b>ALLIGATA</b>			<b>French Mistress A or B</b>	8.95	7.95	<b>Doodlight (2 player joystick/key opt.)</b>	7.95	3.00
<b>Bigga</b>	7.95	6.95	<b>German Master A or B</b>	8.95	7.95	<b>SQUIRRELSOFT</b>		
<b>Super Bundle</b>	7.95	6.95	<b>Spanish Tutor A or B</b>	8.95	7.95	<b>Supergolf</b>	7.50	6.50
<b>Contract Bridge</b>	8.95	7.95	<b>Answer Back Jun or Sen.</b>	8.95	8.95	<b>Tralfalgar</b>	8.00	7.00
<b>Guardian</b>	7.95	6.95	<b>Answer Back Sport</b>	8.95	8.95	<b>Polar Parus</b>	7.95	6.95
<b>Nightmare</b>	7.95	6.95	<b>Italy Europe</b>	7.95	6.95	<b>STELL SOFTWARE</b>		
<b>ATARISOFT</b>			<b>L.C.I.</b>			<b>Identikit (2-8 yrs)</b>	7.95	6.95
<b>Robotron</b>	9.95	8.95	<b>Micro Maths (24 prog)</b>	24.50	21.50	<b>Maths Invader (4-12)</b>	7.95	6.95
<b>A.S.K.</b>			<b>Micro English (24 prog)</b>	24.50	21.50	<b>Stell Railroader (4-12)</b>	7.95	6.95
<b>Number Painter</b>	9.95	8.95	<b>ONEMAN'S SOFTWARE</b>			<b>Stell Time (3-10)</b>	7.95	6.95
<b>Number Guesser</b>	9.95	8.95	<b>First Moves (Chess 8-1)</b>	9.95	8.95	<b>SUPERIOR SOFTWARE</b>		
<b>Best 4 English</b>	19.95	18.45	<b>Master Key (Typing Tutor)</b>	9.95	8.95	<b>Mini Wiz</b>	7.95	6.95
<b>Best 4 Maths</b>	19.95	18.45	<b>MACESEN SOFT</b>			<b>Smash and Grab</b>	7.95	6.95
<b>BUG BYTE</b>			<b>Block Busters</b>	7.95	6.95	<b>Overdrive</b>	7.95	6.95
<b>Twix Kingdom Valley</b>	9.50	8.50	<b>MELBOURNE HOUSE</b>			<b>Tempest</b>	9.95	8.95
<b>COMSOFT</b>			<b>Classic Adventure</b>	6.95	5.95	<b>Pony Penguin</b>	7.95	6.95
<b>Serpents Lair</b>	4.95	3.95	<b>Hemstead</b>	6.95	5.95	<b>Repton</b>	9.95	8.95
<b>Playboys</b>	4.95	3.95	<b>M.C. LOTHORIAN</b>			<b>TALENT</b>		
<b>S.A.S. Commando</b>	4.95	3.95	<b>Redcoats</b>	6.95	5.95	<b>Wings</b>	7.95	6.95
<b>C.B.Die Barrage</b>	7.95	6.95	<b>Paras</b>	6.95	5.95	<b>Laser Reflex</b>	7.95	6.95
<b>C.R.L.</b>			<b>Johnny Reb</b>	6.95	5.95	<b>VISIONS/CSM</b>		
<b>Test Match</b>	6.95	5.95	<b>Special Operations</b>	8.95	5.95	<b>Snooker</b>	8.95	7.95
<b>DR. SOFT</b>			<b>MICRODEAL</b>			<b>Daredevil Dennis</b>	7.95	6.95
<b>747 Flight Sim</b>	7.95	6.95	<b>Arena 3000</b>	8.00	7.00	<b>Sim</b>	7.95	6.95

BOX OF 10 C15 COMPUTER CASSETTES £4.50 inc. VAT & P&P

ALL PRICES ARE INCLUSIVE OF VAT AND CARRIAGE

We guarantee all titles are originals. We offer a quick and reliable service. Most Electron and BBC titles are available on request with the guarantee of at least £1.00 off the R.R.P.

Please send me:	Cost	Please make cheques payable to:	Name
1. _____	£	21st Software.	_____
2. _____	£	Send orders to:	Address
3. _____	£	21st SOFTWARE	_____
4. _____	£	20 Woodside Drive	_____
	£	High Lane, Stockport SK6 8HU	Post Code
	£	Tel: Disley (06632) 3160. (After 6pm)	_____
TOTAL	£		Tel. No.
			_____



# Software Surgery

THE COLUMN THAT TAKES A LOOK INSIDE THE LATEST RELEASES

## Aces High Oasis Software

ACES High is a compilation package of four card games. These can be played either against the computer or between up to five opponents, depending on the game selected.

Draw poker and stud poker are played by the user against as many as five computer opponents. You are allocated £1,000 to start with, and the game ends when one player has accumulated all the money.

The computer is always dealer and always deals to the same player first, which detracts a little from the reality of the game.

You are given the opportunity to fold, check, call or raise, depending on your hand.

Don't worry if you don't understand these terms, or even if you don't know how to play poker, because all is adequately explained in a very handy, explicit booklet which is incorporated in the package.

Blackjack and pontoon are very similar, but have subtle differences which become clear when you use Aces High.

You win the chance to become banker if you get pontoon (in the game pontoon, that is) or a natural (in blackjack).

Again you are given £1,000 to start, and again play continues until one player has accumulated all the cash. All

the programs are very simple to use and, as well as the booklet, instructions are given throughout the games.

They couldn't really go wrong with the graphics, but the cards are well depicted and the layouts good.

The games, as you would expect, are aimed at the more mature market, but kids from about ten years old upwards will enjoy the simpler pontoon and blackjack.

As it is, Aces High gives all the family the chance to enjoy losing their shirts without really noticing it.

Adam Young

## Fly off to war...

### Combat Lynx Durrell Software

IN Combat Lynx, Durrell Software have come up with a unique and exciting war game.

As the pilot of a fully-armed and potentially-lethal Lynx helicopter, you are required to provide air support for four bases. These are constantly under threat of attack by enemy ground forces.

You have a whole arsenal of weapons at your disposal, including landmines, wire-guided anti-tank missiles, air-to-air missiles, and gun pods.

You can select any mix of weapons systems or a standard load.

Your defence can be offen-

sive or defensive, and to help you in this you've access to a constantly updated intelligence map.

This shows the ground contours, the positions of your bases and the dispositions of enemy forces.

From this you can decide where best to lay your mines and where to find the enemy vehicles which you can then strafe with your guns or destroy with your missiles.

While this is going on, you're constantly under attack by enemy missiles. Luckily these aren't guided, and can be easily avoided once you get the hang of the controls.

They're not the only hazards, however – because, like any flying machine, you have a limited range and need to keep a watchful eye on the fuel and temperature gauges.

The instrument panel also incorporates an airspeed indicator, altimeter, compass, and a very useful map co-ordinates indicator which relates directly to the intelligence map.

You can preset the co-ordinates of a particular target and then watch as your position winds down to coincide with them as you guide your machine towards it.

Don't do as I do and become so interested in this that you fly into a hillside!

There's more to the game than merely zapping the enemy.

Your bases sustain damage and casualties occur in the defence. The wounded have to be taken to hospital (Base No

1) and movements of fresh troops are undertaken by means of your helicopter.

Equally inevitable is the fact that just as you get airborne with a helicopter full of wounded, a desperate call for help comes through from a base under heavy attack. What do you do?

It's not for the young or slow of reflex, as flying the



helicopter, avoiding missiles and firing the weapons takes a great deal of acquired skill.

There are at least 15 separate keys to use, some having dual and triple functions depending on the situation. But I do feel that some of these could have been situated in a slightly more convenient way.

The graphics are highly detailed, extremely colourful and very well defined, and I was particularly impressed with the realistic way in which the weapons systems worked.

There are four levels. The



## From Page 27

"easy" still required a great deal of skill and the "hardest" was, for me, virtually impossible.

Together with the very professional packaging, this all adds up to a superb game, thoroughly recommended.

Adam Young

## Hints for all

### Starter Pack Beebugsoft

LET'S face it, the User Guide that comes with the Electron isn't the easiest of books to understand. Many people get frustrated if they find programming a problem and can't find the answer in it.

Beebug have attempted to help them with their Starter Pack.

What you get in the pack is a slim, but well-written booklet, explaining how to use the features of the micro that beginners most often want – graphics and sound.

There is a strong emphasis on the structured approach to programming, with not a GOTO in sight.

The booklet also has a hotch-potch of hints, which almost everybody should find interesting.

These cover features of Basic, the operating system

and memory, as well as books to read and where to find help if you have a problem.

The pack is aimed at both the BBC Micro and the Electron. One chapter is concerned solely with Mode 7. However, it's clearly marked BBC only, so should not cause any problem.

It also contains a cassette



of programs (described in the book). There are eight games programs and six utilities.

The utilities include a "Bad Program" aid and a character definer.

In theory these are useful, but the other utilities – a function key editor, a memory display, a utility editor and a sound wizard – are rather poor.

Having two different programs in memory is never easy.

The games are a varied and tidy selection of arcade-type and strategy games.

Old favourites are there such as Life, Galaxians, Con-

nect 4, Reversi and Marslander. There is a version of Zombies and a football game.

The pick of the bunch is Blockblitz, which provides all the irritation and frustration to make you play it again and again.

To complete the pack you also get a screen planning sheet, some character planning sheets and a function key strip.

The trouble with the package is that the cassette and booklet don't complement one another.

If you are a real beginner, the booklet may be beyond you, but then the tape provides a selection of good magazine-type games to keep you occupied.

However, if you wish to dabble in programming, then the booklet is useful, and, if you want the programs as well, the whole package represents good value.

Rog Frost

## Learning to read...

### Read Right Away (Reading Pack 1) Highlight Software

HIGHLIGHT Software aims this pack at five-to-eight year-olds and it's designed to help develop reading skills.

There are two programs on the tape, and each can be

played by an individual or by up to four people in competition.

The first game is called Splashdown and the idea is to collect a letter to complete a three-letter word.

You have a boat with two letters already in it. When an aeroplane flies over, flashing in



your colour, you must press a letter that will complete a word.

If correct, the letter drops into the boat, which then sinks. Sink five boats and you are the winner.

Any player who completes five words in the same round is a winner, and is rewarded by having a submarine pull a "win" banner to his name.

This program is well constructed and seems to have a good vocabulary. Different skill levels refer to the number of permitted mistakes.

There is also an option to give each player the same two letters – all of which make a different word when completed.

One other very useful option is the choice of which of the three letters is missing from a word.

The graphics are pleasing and good use is made of double-sized lettering. A good program.

The second program, Firefight, is probably aimed at the eight-year-olds rather than the fives.

You play the part of a fireman who must rescue a girl from a burning house. To reach her you must cross some burning gaps.

These can be bridged by selecting the appropriate two letters to complete a word.

There are four gaps to fill, and then the fireman can reach the girl and carry her to safety.

As in the first game, there

## Colourful game for the young

### Ultron Icon Software

ULTRON is another game of the Space Invaders school.

Although highly colourful and with a certain variety in that the aliens sometimes move across the screen instead of down, sadly there isn't a lot of originality in it.

There are four stages in the game, each one slightly harder than the previous one.

Your laser base moves along the bottom, knocking off the aliens and avoiding the bombs.

The third screen has a 3D effect in that the Space

Invaders seem to appear out of the distance in ones and twos, and the fourth has one huge alien with a smaller alien inside.

You have to chip your way through the thick outer skin to get at the points inside. If you manage to do this, you are given an opportunity to earn a bonus.

While the average arcade game fan has long since left this sort of thing behind, I feel that Ultron may appeal to the younger user.

Certainly the keys are easily manageable and the screen layouts simple, with explicit instructions on an accompanying leaflet.



It's one for young beginners, not experts.

Adam Young



are good graphics and double-height text and a useful range of consonant blends to practice with.

One gripe with this program is the use of cursor keys, which are too near Break. This is a bad mistake in software designed for young children.

A problem with both programs is that the auto repeat is left on. Again, youngsters are inclined to be heavy-handed on the keyboard and this little bug can cause frustration.

Overall, though, this is a good package.

It appeals to children, and people looking for educational software could well consider this one, especially as there are three more packs in this series. These aim to develop word-building skills with six-to-11-year-olds.

Rog Frost

## Bouncing back

**Pinball**  
Microbyte Software

YOU don't have to be a wizard to play the latest pinball.

This is a simulation of the classic pre-electronic arcade game known to millions.

I dimly remember spending my school lunch hours battling forth, pitting my wits against machine. The ring of bells and burst of buzzers... oh memories!

Since then I've grown old on bar billiards, then Space Invaders, and lately the dreaded adventure game - but mention pinball and my eyes melt over.

If you don't remember



pinball or if you're of the Space Invader generation, then here's the problem:

A silver ball bounces its way around obstacles on the top of a tilted table. Using two flippers you have to stop the silver ball falling out of play at the bottom of the table.

By skilfully controlling them you can guide it towards the high-scoring areas. Lights, buzzers and bells show when and where the points are made.

This program has excellent graphics that bring alive the thrill of the game. The ball moves realistically from buffer to buffer with that element of randomness always present in the original machines.

Unfortunately the sounds don't reflect the true pinball. I suppose that is the price of progress.

Gone are the solenoids and bells, buzzers and bumpers, and in return we have electronic noise.

My great enthusiasm for this game was slightly marred by the apparent slowness of its response. However, I feel that the computer is truly reflecting the pinball machine.

I regret to say that the first pinball was slow compared to our electronic entertainers.

I guess it must have been the endurance of our concentration over spans of inactive observation that made it a challenge.

There's no tilt to the game, so key-bashing won't be penalised. There's no need for joysticks but it would've been better if the two fire buttons were used to operate the flippers.

Generally this is a good game, certainly different from the usual arcade action. Disappointing to my sensitive memories, but entertaining all the same.

John Woollard

## Bags of bugs

**Bug Eyes**  
Icon Software

IT'S amazing how much Icon have improved since their early days. Bug Eyes is their best yet.

It's described on the rather smart cassette case as a fantasy arcade adventure. I

wouldn't agree with the adventure part, but it's certainly a good arcade game.

Your objective is to reach the master power generator at the heart of a giant spaceship. This must be destroyed to prevent the Bug Eyes from reaching Earth.

There are 10 different levels to be negotiated within the ship.

At first it's quite easy with just a few bits of machinery to avoid. But on later screens there are various bugs and monsters bouncing up and down and flying around.

There are expanding and contracting platforms and disappearing walkways. If you're too slow they're gone and you'll fall on to rows of deadly spikes.

It's a fairly simple game with only two keys to control the man, left and right. The main difficulty is timing your run across the platforms and under the machinery so that you're not squashed or hit by flying bugs.

The graphics are superb, and although it's in Mode 1 with only four colours they're very sharp and move smoothly.

The demonstration mode, which flicks through all the screens, is quite nice to watch.

Bug Eyes is a simple but enjoyable game which will keep you amused for quite a while. Arcade addicts may think it a bit too easy, but I found it just about my level.

Roland Waddilove

## Treasure quest

**Sphinx Adventure**  
Acornsoft

SPHINX Adventure was the first adventure to be released by Acornsoft and is, to my knowledge, still the only one available on cassette for the Electron.

It's modelled very generally on the original Crowther and Woods Colossal Caves.

You'll meet some familiar characters in it, though, to be fair, it is nothing like Colossal Caves and is a very worthy adventure in its own right.

Your task is to search an underground complex to add

yet more treasure to the pile you have built up from previous adventures.

You start your quest on a well-trodden road and a quick search of the surrounding countryside should find you equipped for the start of your quest.

Then it's off to the Valley of Doom and down to the Hall of Spirits for the start of your perils.

You'll soon come across a pirate and a dwarf who will leave you an axe.

Your first major problem is likely to be in getting past the



fiery passage - this is where you find out whether you have the bottle for this adventure!

Later you'll need to escape from a sea-serpent - match that if you can!

The troll shouldn't prove to be much of a problem. You should be able to discover where he puts his loot.

If you manage to satisfy the crocodile's appetite you'll find something useful - but be careful not to rub it up the wrong way.

Right! That's enough clues! One thing I couldn't discover was whether there was any meaning to the graffiti in the Inner Sanctum. I'm sure there are more locations to be discovered here. Please let me know if you have figured it out.

I've managed to map more than 100 locations so it is a big adventure. In fact I must confess that it is one of those games that keeps you up until the small hours. Five o'clock in my case.

Overall, an extremely good adventure and one that I can wholeheartedly recommend. Let's hope Acornsoft do conversions for their other adventures. Excellent stuff.

Merlin

OVER the next few months we'll be taking a look in depth at the disc systems available for the Electron. Roland Waddilove will be exploring the Plus 3, while I'll be trying out the Cumana filing system.

Before we get down to specific products, however, we thought that we should just cover a few simple features of disc systems in general.

I lost the toss – the disc landed label side down – so I'm writing the preliminary article.

To begin. Two things are needed for a micro to work with discs. The first is, fairly obviously, a disc drive. This corresponds to the familiar cassette recorder. The cassette recorder uses tapes, the disc drive uses discs.

The second, less obvious, requirement is for a piece of software to actually get the micro and the disc drive working in unison.

Without this program linking the computer and the disc drive, arranging when and how data is to be transferred between one and the other, the disc drive would be so much junk.

The drive may be physically interfaced to the micro but it won't work without the software interface supplying the intelligence. This piece of

# Get on the right in the drive for

## Feeling a little dense about densities? Lost track of BIBBY guide you through the Electron disc system

software, always on a ROM chip, is known as the Disc Filing System or DFS.

However, with something like the Plus 3 the division becomes a little blurred as both the DFS – in this case the Acorn Advanced Disc Filing System or ADFS – and a disc drive come together in one package.

The split is easier to see in the Cumana filing system.

Here the software is contained in the cartridge that plugs into the Plus 1. The disc drive is attached to this cartridge by a length of ribbon cable.

Whichever system is used, however, will have both the software and the hardware.

The disc drives themselves

are fairly standard, usually being one of two types known as 5.25in and 3.5in drives. These figures refer to the actual dimensions of the floppy discs that the drives use.

The larger 5.25in discs have been the usual size but now the smaller, more robust discs are becoming the industry standard.

Despite their reduced size they can hold just as much information.

Staying with the hardware side of things, information can be stored on one or both sides of a disc.

If only one side is used, then the drive is known as a single-sided drive. If both sides are used it's called a double-

sided drive.

With a double-sided drive the DFS looks on each side of the disc as a separate drive. This may seem odd, but it's a useful fiction.

When you consider that most DFSs allow two disc drives to be used in tandem – has anyone done this with a Plus 3? – you can see that if double-sided drives are joined the DFS thinks it has four drives.

So a drive may be double or single-sided. It may also be what is known as 40 or 80

**‘Each particular filing system has its own way of formatting the disc’**

track or, more flexibly, able to read from both at the flick of a switch.

And to understand what that means, we have to go back to the software.

When you first get a new disc – 3.5 or 5.25, it makes no matter – it's completely blank. In that state it's useless to the DFS, which expects the disc to have certain magnetic markings on its surface.

It needs these to find its way around the disc, organising the data and programs that the micro has told it to load or save.

The point to grasp is that the disc's surface has to be

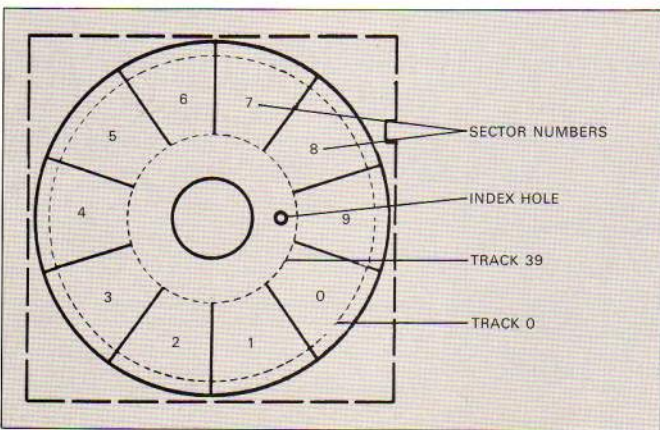


Figure 1: Showing the 10 sector single density format (the sectors are laid out during the format process). With thanks to Cumana.



# ht track r discs

your floppies? Then let PETE  
in the first of a new series

marked out in a specific electromagnetic pattern for the DFS to make sense of it.

A special program, called a formatter, is used to mark out or format these discs. So when you buy a blank disc it will have to be formatted.

Happily, you get formatting programs when you buy your DFS.

Unhappily, the format used differs from DFS to DFS. This means that while my Cumana system uses 3.5 discs that will physically fit into Roland's Plus 3, that's where it ends. Neither DFS can read the other's discs as the formatting is different.

What the formatter does is to arrange the face of the disc into a series of concentric tracks. The number of these tracks varies but is usually either 40 or 80.

These tracks are further subdivided into what are known as sectors, usually 8, 9, 10 or 16 of them to a track.

Figure 1 shows a 40 track disc (0 to 39) with 10 sectors (0 to 9) in each track. We've used a BBC Micro disc so as not to be accused of favouritism!

Discs for the Plus 3 have 80 tracks and each of these tracks is divided into 16 sectors.

With the Cumana disc you have the choice of either 40 or 80 tracks. Each of these tracks is divided into nine sectors.

From this you can see why the formats of the varying discs are incompatible.

One other major difference is how much information can be held in one of these sectors.

A Plus 3 sector can hold 256 bytes while the Cumana

packs in 512 bytes of data. As you can see, there's twice as much information stored in a Cumana sector.

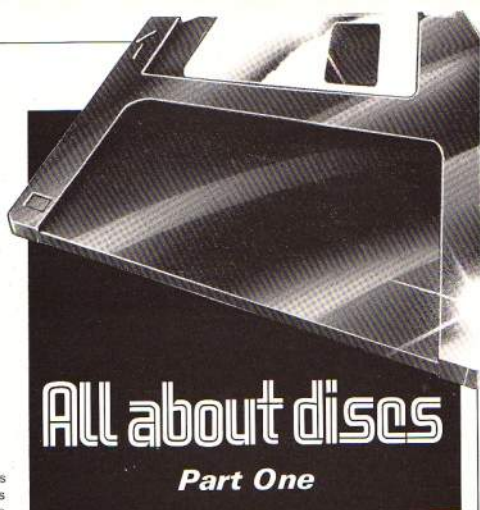
Systems that use such packing techniques are known as double-density DFSs.

However, nothing in life is that simple. If you look at the number of sectors on the Plus 3 disc you'll see that there are practically twice as many as on the Cumana disc or the BBC Micro disc in Figure 1.

And, that's where we'll leave discs for now.

The main point to grasp is that each particular filing system has its own way of formatting the disc. Tracks, sectors and bytes in a sector vary from one to the other.

However, if you stick to just your own DFS you should have no problems.



## All about discs

### Part One



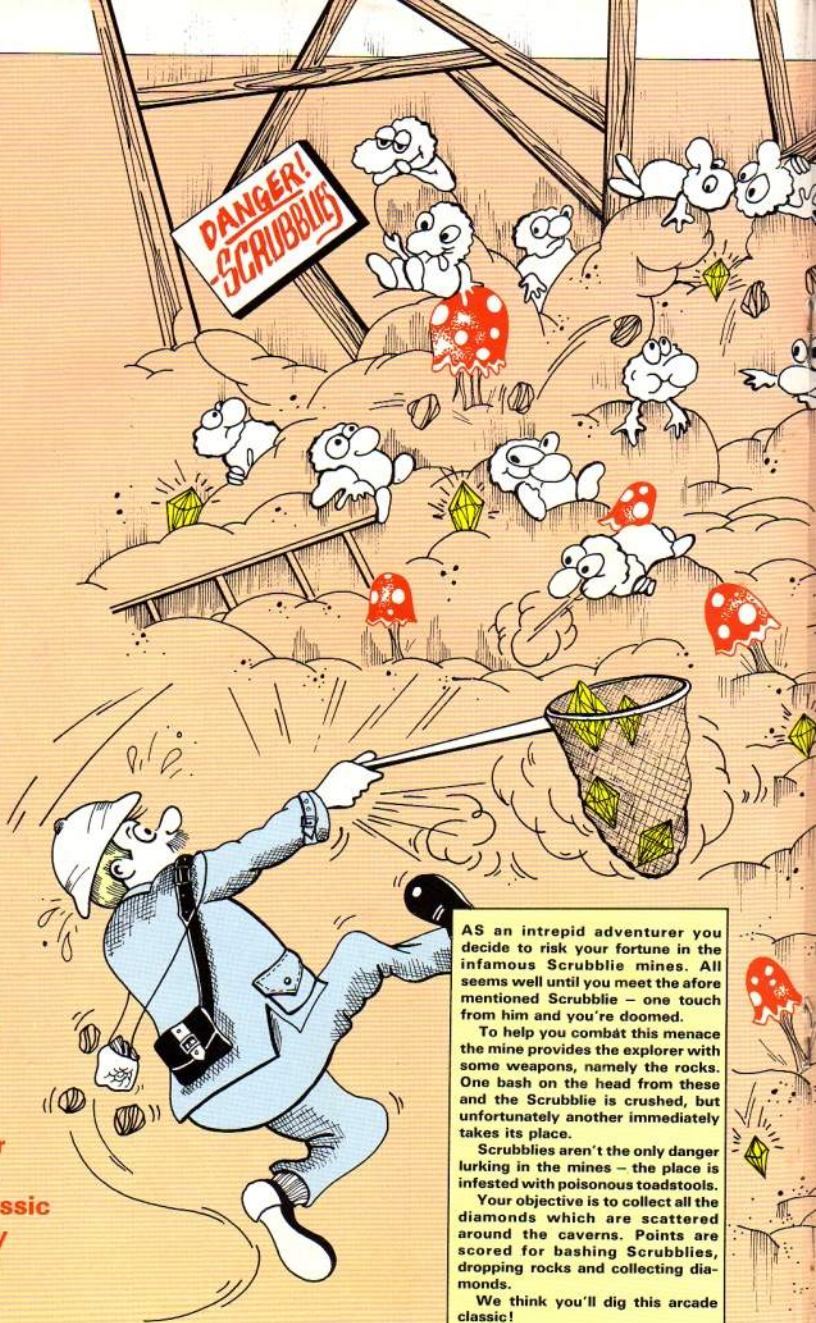
Cumana disc drive which attaches to the Plus 1



The Electron with the Plus 3 attached

# DIGGA

Dig for diamonds – and dear life in this arcade classic devised by **STEPHEN MARTIN**



AS an intrepid adventurer you decide to risk your fortune in the infamous Scrubblie mines. All seems well until you meet the afore mentioned Scrubblie – one touch from him and you're doomed.

To help you combat this menace the mine provides the explorer with some weapons, namely the rocks. One bash on the head from these and the Scrubblie is crushed, but unfortunately another immediately takes its place.

Scrubblies aren't the only danger lurking in the mines – the place is infested with poisonous toadstools.

Your objective is to collect all the diamonds which are scattered around the caverns. Points are scored for bashing Scrubblies, dropping rocks and collecting diamonds.

We think you'll dig this arcade classic!







# Digga listing

## From Page 33

```

E:JSR&FEE:LD&7F:JSR&FEE:
LD&#135:JSR&FF4:TXA
64 CMP#128:BEQ#1
65 CMP#133:BEQ#1
66 CMP#131:BEQ#1
67 CMP#130:BEQ#1
68 STA#86
69 LD&#228:JSR&FEE:RTS
70 .SKIP JMPR
71 .u DEC&7E:JMP#0
72 .d INC&7E:JMP#0
73 .r INC&7F:JMP#0
74 .l DEC&7F:JMP#0
75 .b1 LDY&8F:LD&#80:STA
&8F:TYA
76 CMP#1:BEQ#0:CMF#2:BEQ#0:
CMF#3:BEQ#1:CMF#4:BEQ#1
77 .a LD&#1:STA&85:LD&#2
28:JSR&FEE:JMPR
78 .R
79 LD&#17:JSR&FEE:LD&#3
:JSR&FEE
80 LDY#4
81 .rocks
82 LD&#31:JSR&FEE:LD&#7
4:X:JSR&FEE:LD&#79:X:JSR&F
FEE:LD&#32:JSR&FEE:LD&#10:
JSR&FEE:LD&#8:JSR&FEE:STX
&87:LD&#135:JSR&FF4:STX&88
:LDX&87:LD&#88
83 CMP#132:BEQ SQUASHED
84 CMP#32
85 BNEprint
86 .FALL
87 INC&79,X
88 LD&#79,X:CMF#27:BEQ#1
89 .print
90 LD&#31:JSR&FEE:LD&#7
4:X:JSR&FEE:LD&#79,X:JSR&F
FEE:LD&#228:JSR&FEE:DEX:BN
Erocks
91 RTS
92 .J LD&#1:STA&8A:LD&#7
:JSR&FEE:JMPprint
93 .SQUASHED LD&#1:STA&8
3:LD&#32:STA&86:JMP FALL
94 )
95 NEXT
96 ON ERROR SOUND&11,3,2
55,5:GOTO102
97 *FX21,4
98 *FX21,5
99 *FX21,0
100 DIM#(10),HIX(10)
101 VDU19,2,2,0:;FORT=170
10:N#(T)="STEPHEN":HIX(T)=1
500:NEXT:VDU23,1,0,0,0,0,0
102 PROCinit
103 PROCbegin
104 ?&85=0:??&73=0:SCX=0:L
IX=3:LX=1
105 PROCinit
106 PROCscreen
107 PROClevel
108 PROCobjects
109 ?&8D=0:RND(4)
110 IFRND(5)*(2THEN??&8F=RN
D(4)
111 CALL Q%
112 IF?&85=1THEN??&85=0:PR
OCdead
113 IF?&73=1THENSXCX=SCX+2
00:SOUND&11,1,200,5:??&73=0:
??&7E=9:??&7F=8
114 IF?&8C=1THEN??&8C=0:SC
X=SCX+50:SOUND&11,1,255,5:D
IX=DI+1:IFDI%5THENPROCQOT
115 IF?&8A=1THEN??&8A=0:SC
X=SCX+100
116 L=LEN(STR$(SCX)):PRIN
TTAB(12-L,4):SCX
117 GOTO109
118 DEFPROCtitle:CLS:COLO
UR3:PRINTTAB(7,3)"DIGGA":CO
LOUR2:PRINTTAB(6,10)":UP:
PRINTTAB(6,12)"/DOWN":PRIN
TTAB(6,14)"/LEFT":PRINTTAB
(6,16)"/RIGHT":TAB(6,18)"P
AUSE":TAB(6,20)"S SOUND":
TAB(6,22)"D SILENCE":TAB(5,
24)"ESCAPE EXIT"
119 COLOUR3:PRINTTAB(2,28
)"ANY KEY TO START"
120 X=INKEY(500):ENDPROC
121 DEFPROCchi:CLS:COLOUR3
:PRINTTAB(3,3)"HISCORE TAB
LE":COLOUR1:PRINT"":FORT=1
T09:PRINTTAB(2,1)"/N#(T
):TAB(14):HIX(T):PRINTNEXT
:PRINTTAB(11)"/N#(10):
TAB(14):HIX(10):COLOUR3
122 IFQ=TRUE THEN FORT=1T
0500:NEXT:Q=FALSE:ENDPROC
ELSE PRINTTAB(2,30)"ANY KEY
TO START":K=INKEY(500):END
PROC
123 DEFPROCscreen
124 PROCtitle
125 IFK=-1THEN126ELSENDP
ROC
126 PROCchi
127 IFK=-1THEN128ELSENDP
ROC
128 scrX=1
129 PROCscreen:PROClevel
130 PRINTTAB(11,29)"ANY K
EY TO START"
131 K=INKEY(250)
132 IFK=-1THEN133ELSEscrX
=1:ENDPROC
133 scrX=scrX+1:IFscrX=12
THENscrX=1:GOTO124
134 GOTO129
135 DEFPROCwelldone:CLS:C
OLOUR3:PRINTTAB(1,10)"LEVEL
":LX="COMPLETED":PRINTTAB
(5,17)"ENTERING":PRINTTAB(4
,19)"NEXT STAGE":SOUND&11,2
,255,25:FORY=1T04000:NEXT:E
NDPROC
136 DEFPROCpause
137 *FX15,1
138 A=GET:ENDPROC
139 DEFPROCQOT
140 ?&73=0
141 PROCwelldone
142 LX=LX+1:scrX=scrX+1:I
FscrX=13THENSXCX=1
143 PROCscreen:PROClevel:
PRINTTAB(15,4):LX:DI=X:??&7
2=0:PRINTTAB(3,4):LIX%
144 GOTO108
145 DEFPROCnewhi:IFSCX<H
IX(10)THENENDPROC
146 CLS:COLOUR3:PRINTTAB
(3,2)"TOP TEN SCORE":TAB(2,9
)"ENTER YOUR NAME":TAB(5,17
)"-----":TAB(5,17):SOUN
D&11,2,255,25
147 VDU23,1,1,0,0,0,0,0
148 *FX21,0
149 X=&80:Y=&A:AX=0
150 ?&A0=&A00:??&A2=0:??&
A3=32:??&A4=128
151 CALL&FF1:AF=&A00
152 VDU23,1,0,0,0,0,0
153 slot=0
154 REPEAT:slot=slot+1:UN
TIL SCX=HIX(slot)
155 FORT=9T0slot STEP-1
156 HIX(P1)=HIX(P):N#(P+
1)=N#(P):NEXT
157 HIX(slot)=SCX:N#(slot
)=#8
158 Q=TRUE:PROCchi:ENDPROC
159 DEFPROCscreen
160 COLOUR1
161 CLS:PRINTTAB(0,1):PRI
NTSTRINGS(19,CHR&224):PRINT
CHR&224:SPC(17):CHR&224:PRI
NTCHR&224:SPC(17):CHR&224:P
RINTSTRINGS(19,CHR&224):PRI
NTCHR&224:SPC(17):CHR&224:P
RINTCHR&224:SPC(17):CHR&224
:FORT=1T020:PRINTCHR&224:SP
C(17):CHR&224:NEXT
162 PRINTSTRINGS(19,CHR&2
24)
163 PRINTCHR&224:SPC(17):
CHR&224:PRINTSTRINGS(19,CHR
&224):PRINTTAB(0,9):FORT=1
T020:COLOUR2
164 PRINTTAB(1,7):STRIN
G&(17,CHR&225):NEXT:COLOUR3
:PRINTTAB(2,3)"MEN":SPC(2):
"SCORE":SPC(2):"LEV":PRINTT
AB(3,4):"3":SPC(3):"0000":
SPC(3):"1"
165 ENDPROC
166 DEFPROCobjects
167 ?&70=9:??&71=8:VDU31,9
,8,226
168 FORT=1T04
169 X=RND(16)+1:Y=RND(10)
+10:C=FNscrn(X,Y):IFC<129T
HEN169
170 ??&74=X:??&79=Y:VDU31
,??&74,??&79,227:NEXT
171 FORT=1T05
172 X=RND(16)+1:Y=RND(10)
+10:C=FNscrn(X,Y):IFC<129T
HEN172
173 VDU31,X,Y,229:NEXT
174 FORT=1T05:COLOUR1
175 X=RND(16)+1:Y=RND(10)
+10:C=FNscrn(X,Y):IFC<129T
HEN175
176 VDU31,X,Y,230:NEXT
177 X=RND(16)+1:Y=RND(10)
+10:C=FNscrn(X,Y):IFC<129T
HEN177
178 ?&7E=X:??&7F=Y
179 ENDPROC
180 DEFPROCinit
181 VDU23,224,0,253,253,2
53,0,239,239,239:VDU23,225,
255,255,255,255,255,255,255
,255:VDU23,226,24,24,6,60,9
0,24,36,182:??&72=0
182 VDU23,227,0,28,62,110
,122,86,124,56:VDU23,228,24
,68,126,153,153,255,165,153
:VDU23,229,64,224,72,28,72,
226,71,2:VDU23,238,68,110,1
87,255,24,24,24,24
183 DI=X:scrX=1:??&8F=RND
(4):X=RND(-TIME):ENVELOPE1,
129,-122,-54,-94,97,22,21,1
26,0,0,-126,126,126:ENVELOP
E2,129,15,-123,110,233,84,4
8,126,0,0,-126,126,126:ENVE
LOPE3,129,-84,42,-78,247,23
0,156,126,0,0,-126,126,126
184 Q=FALSE:ENDPROC

```



```

185 DEFFN$scrn(QX,WX)
186 AX=135
187 VDU31,QX,WX
188 =(USR(&FFF4)&AND&FFF0)
DIV&100
189 DEFPROC dead
190 %73=0
191 VDU19,0,3,0;SOUND&11
,3,255,5;FORV=1T0500;NEXT:V
DU20;VDU19,2,2,0;
192 *FX15,1
193 LIX=LIX-1
194 IFLIX=0THEN195ELSE143
195 PRINTTAB(4,14)"
"
196 PRINTTAB(4,15)" GAME
OVER "
197 PRINTTAB(4,16)"
"
198 FORV=1T0600;NEXT:PRO
Cnewh1;GOTO103
199 DEFPROC level
200 ONscr%GOTO201,202,204
,205,206,207,208,209,210,21
1,212,213
201 COLOUR3:PRINTTAB(1,29
)"THE MINE ENTRANCE":ENDPR
C
202 FORX=1T09STEP8
203 COLOUR1:PRINTTAB(4+X,
15);CHR$224:PRINTTAB(4+X,16
);CHR$224:PRINTTAB(2+X,17);
CHR$224:CHR$224:CHR$224:CHR
$224:CHR$224:PRINTTAB(4+X,1
8);CHR$224:PRINTTAB(4+X,19)
;CHR$224:NEXT:COLOUR3:PRINT
TAB(1,29)" MAIN TUNNEL":E
NDPROC
204 BLOCK$=CHR$224+CHR$22
4+CHR$10+CHR$8+CHR$8+CHR$22
4+CHR$224:COLOUR1:FORX=0T01
25STEP1:PRINTTAB(3+X,12)BL0
CK$:PRINTTAB(3+X,22)BLOCK$:
NEXT:COLOUR3:PRINTTAB(1,29)
" SECONDARY SHAFT":ENDPROC
205 CROSS$=CHR$224+CHR$10
+CHR$8+CHR$8+CHR$224+CHR$22
4+CHR$224+CHR$10+CHR$8+CHR$
8+CHR$224:COLOUR1:FORX=0T01
15STEP10:PRINTTAB(4+X,12):CR
OSS$:PRINTTAB(4+X,22):CROSS$
:NEXT:COLOUR3:PRINTTAB(1,2
9)"THE CREATURE CAVE":ENDPR
OC
206 COLOUR1:VDU31,9,14,22
4,8,10,224,8,10,224,9,10,22
4,10,8,8,8,8,224,224,224,22
4,224,224,224,8,8,8,8,10,22
4,8,10,224,8,10,224,8,10,22
4:COLOUR3:PRINTTAB(1,29)" S
CRUBBLY CAVERN":ENDPROC
207 COLOUR1:PRINTTAB(8,16
);STRING$(3,CHR$224):PRINT
TAB(8,17);STRING$(3,CHR$224
);PRINTTAB(8,18);STRING$(3
,CHR$224):PRINTTAB(8,19);S
TRING$(3,CHR$224):COLOUR3:
PRINTTAB(1,29)" THE ROCK R
OOM":ENDPROC
208 COLOUR1:FORX=0T012STE
P1:PRINTTAB(3+X,22)BLOCK$:
NEXT:COLOUR3:PRINTTAB(1,29)
"FORGOTTEN CAVERN":ENDPROC
209 COLOUR1:PRINTTAB(9,10
);CROSS$=FORX=0T011STEP10:P
RINTTAB(4+X,16):CROSS$:NEXT
:PRINTTAB(9,22):CROSS$:COLO
UR3:PRINTTAB(1,29)"NOTRADA
ENTRANCE":ENDPROC
210 COLOUR1:PRINTTAB(8,10
);BLOCK$=CHR$224:CHR$8;CHR$
11:CHR$224:FORX=1T011STEP9:
PRINTTAB(3+X,16);BLOCK$:NEX
T:PRINTTAB(8,22);BLOCK$:CHR
$224:CHR$8;CHR$11:CHR$224:C
OLOUR3:PRINTTAB(1,29)" N
OTRADAMA":ENDPROC
211 COLOUR1:PRINTTAB(4,10
);CROSS$:PRINTTAB(14,22):CR
OSS$:COLOUR3:PRINTTAB(1,29)
" THE GRAVEYARD":ENDPROC
212 COLOUR1:PRINTTAB(4,10
);BLOCK$:PRINTTAB(13,22);BL
OCK$:COLOUR3:PRINTTAB(1,29)
" THE TOADSTOOLS":ENDPROC
213 COLOUR1:PRINTTAB(9,10
);CROSS$=FORX=0T011STEP10:P
RINTTAB(4+X,22);CROSS$:NEXT
:COLOUR3:PRINTTAB(1,29)" T
HE MINE EXIT":ENDPROC

```

This listing is included in this month's cassette tape offer. See order form on Page 61.

EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES...EPIC ADVENTURES



## The Definitive Adventures for the Electron...

"Having now tried all the Epic Adventures, they must be the yardstick by which all other adventures for the Electron should be judged."

ELECTRON USER

"The Wheel of Fortune for the BBC and Electron is a highly-recommended state-of-the-art adventure."

SHIELDS GAZETTE

"This has to be the adventure of 1984. It really is superb."

MICRONET 800

"The definitive adventure. Highly recommended."

ELECTRON USER

Our other three adventures have also received superb reviews in Electron User. They each contain approximately 230 locations and 25,000 characters of text.

## The Wheel of Fortune

This game is a classic puzzle adventure with all the features you'd expect from EPIC...

### PLUS

- Intelligent moving characters with varying moods. And you can talk to them too!
- Multistatement language and speech interpreters.
- Runs in real time.
- 250 locations and over 30,000 characters of text. Only Epic's compression techniques can pack so much into the Electron.

TO: EPIC SOFTWARE, DEPT. E, 10 GLADSTONE ST., KIBWORTH BEAUCHAMP, LEICESTER LE8 0HL Please Rush Me -

	CASSETTE	DISC	STATE:
.....qty THE WHEEL OF FORTUNE	\$9.95	\$11.95	BBC/
.....qty CASTLE FRANKENSTEIN	\$7.95	\$9.95	ELECTRON
.....qty THE QUEST FOR THE HOLY GRAIL	\$7.95	\$9.95	(Delete)
.....qty THE KINGDOM OF KLEIN	\$7.95	\$9.95	No Graphics on Electron

POSTAGE & PACKING FREE FOR 2 OR MORE. ADD 50p FOR ONE.

I enclose Cheque/P.O. to the value of \_\_\_\_\_ (Payable to 'Epic Software')

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

POST CODE \_\_\_\_\_

All programs available for immediate despatch. Dealer enquiries welcome. Help Service. Send letter if you don't want to cut magazine.

\*\*\* NEW: FREE HELP SHEETS NOW AVAILABLE. EACH CONTAINS 100's OF CLUES - JUST SEND SAE \*\*\*

# Suppose you could alter your micro's keyboard...



**JOHN WOOLLARD**  
can be done with

**THE way a particular type of computer behaves, the instructions it understands and the screen display it produces, is dependent upon the hundreds of short machine code routines that make up its Operating System.**

By changing these routines and the values they use we can change the way the micro works. \*FX calls have been specifically designed to help us change these subroutines and the values used by them.

This month we'll be looking at the keyboard, the way it operates and how using \*FX can change its actions.

On power up each key of the keyboard has a particular action. There are lots of \*FX calls that can be used to

change the action of each and every key.

These changes are necessary to make some programs work more efficiently. Others wouldn't work at all without them.

Calls can also be used to protect a program written in Basic from corruption and interruption by a user.

I'll show how each of the calls can be used in a variety of programs and procedures.

The procedures are designed to be incorporated into Basic programs. They can be typed and SAVED in the usual way or they can be recorded as \*EXEC files which allow them to be easily merged into existing Basic programs.

Let's start our look at the keyboard with the Break key.

I'm frequently infuriated by this key. It fouls up arcade games, destroys all the inputted data and, at best, makes programs start again from the beginning.

As you've probably found by experience, pressing the Break key physically and irreversibly interrupts processing by the computer.

The trouble is that its action can't be prevented by the use of software. The best we can hope for is that a program can be restarted without losing vital information. Unfortunately that, too, is difficult to achieve.

One useful technique is to define the Break key so that if it is pressed then OLD and RUN are automatically enacted and the program restarts

immediately.

**\*KEY1BOLD:MRUN:1M**

does the job. As well as this, there are a few \*FX calls that affect the Break key and have some programming value.

\*FX200 is the ultimate form of program protection. By using \*FX200.2 the pressing of Break causes the permanent destruction of the program in memory. Even the use of OLD fails to recover it!

Empty the micro's memory with:

**NEW**

and then enter Program 1 and try it for yourself.

If you press Break then enter OLD and LIST, you'll find that the program can be seen.

Now type \*FX200.2 and press Break. Entering OLD will

**FOLLOW these instructions to merge a procedure into your own programs.**

1. Type the procedure into your computer.
2. Check that it works!
3. Renumber it from 32000 in steps of 1.
4. Decide on a name for the tape file such as PROC1.
5. Type \*SPOOL PROC1 then press Return.
6. Rewind a blank cassette, then press Play and Record.
7. Press Return again.
8. Type LIST. Return.
9. Type \*SPOOL. Return.

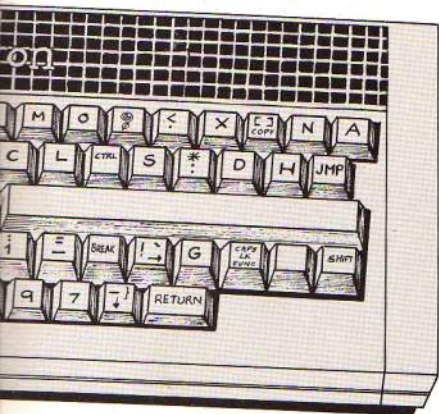
You'll have a SPOOLED copy of the procedure on cassette.

Now you need to merge it into your own program:

1. Load program.
2. You may need to RENUMBER your own program (if it uses lines 32000 onward).
3. Type \*EXEC PROC1. Return.
4. Put the cassette with the procedure in the player, rewind it and then press Play.
5. Ignore the Syntax errors that appear!
6. When the procedure has loaded check that it is in place by LISTing your program.

The procedure will now be at the end. It may be moved by RENUMBERing the individual lines.





## explains how it \*FX commands

always give Bad Program!

There is a set of three \*FX calls that can be used to modify the action of the Break key. However, their use requires a little knowledge of machine code programming.

When the Break key is

```
10 REM PROGRAM I
20 REM This program does
   nothing
30 REM
40 REM
```

Program I

pressed the computer looks to a location in memory. Normally it contains zero (equivalent to machine code BRK). When it finds this, the

computer carries out its normal Break routine.

However, the use of \*FX247,76 changes the BRK instruction to JMP. \*FX248,1sb and \*FX249,hsb set the location to which the micro jumps.

That location is the start of your own machine code routine. It may recover all the data entered and then allow the original program to continue.

Program II contains a procedure that can be placed in any of your own programs. A machine code routine is created which comes into action straight after the Break key has been pressed.

You determine what the program does by entering a message in line 20. The format

of that message is exactly the same as if you were programming the Break key directly by using \*KEY10.

For example:

```
OLD:MRUN:IM
```

would make the computer restart the program whereas:

```
IREM:IM
```

would irreversibly corrupt the program!

\*FX253 is used to discover what type of Break was made previously. The two types are soft Break – simply tapping the Break key – and hard Break (pressing Ctrl + the Break key).

\*FX255 has several functions.

It can be used to determine the screen mode that appears after Break has been pressed –

normally Mode 6. It's also used to cause the micro to auto boot or not to auto boot after Break has been pressed.

This is only relevant to users of a cartridge system – Acorn Plus 1 – or disc users – for example, Acorn Plus 3. We'll deal with these in future months.

To change the mode of your Electron after Break has been pressed, enter \*FX255,x where x is the number of the mode you want.

Last time we saw how the Escape key could be disabled using the \*FX229 call.

\*FX229,0 makes the Escape key interrupt the action of a program. \*FX229,1 causes the Escape key to

# \*FX Part Two OS CALLS

Address		1sb	hsb
denary	hex		
32	20	20	0
257	101	1	1
2048	800	0	0
32767	7FFF	FF	FF

Box II: My address has two bytes!

```
10REM PROGRAM II
20PROCbreakkey('CLS:MOLD
:MRUN:IM')
30END
40DEFPROCbreakkey(message$)
50IF message$="BREAK" THEN
!%287=0:ENDPROC
60*FX247,76
70*FX248,0
```

```
80*FX249,9
90lenX=LEN(message$)
100FOR chrX=1 TO lenX
110 byteX=byteX+1
120 byteX?%70=ASC(MID$(message$,chrX,1))
130 IF MID$(message$,chrX,1)='!' THEN chrX=chrX+1:byteX?
140=ASC(MID$(message$,chrX,1))
150-64
```

```
140NEXT
150lenX?%71=6FF
160FOR optX=0 TO 255 STEP 2
170Pz=k900
180LOPToptX
190CCrts
200LDX#1:LDY#0:LDA#229:JS
R&FFF4
210LDA#139:LDX#1
220:loop
```

```
230LDY#70,X:CPY#FF:BEQrt
240INX:STX#70:LDX#0
250JSR&FFF4:LDX#70
260JMP:loop
270.rts RTS
280J
290NEXT
300ENDPROC
```

Program II

## From Page 37

produce CHR\$27 when pressed, leaving the program running.

There are several other \*FX calls that affect the action of the Escape key.

\*FX124 resets the Escape flag, \*FX125 sets the Escape flag and \*FX126 is used to acknowledge the detection of Escape. These calls are used in machine code programs and are not necessary in Basic.

\*FX200 is the best method of nullifying the action of the Escape key, \*FX200,1 causing it to have no action whatsoever.

\*FX220,x makes another key act as the Escape key. For example \*FX220,65 causes the A key to become Escape. Pressing A now stops the listing and working of a program.

\*FX220,x affects the key with ASCII value x.

Try typing \*FX220,13 and finding which key is then acting as the Escape key.

When the Escape key is pressed all processing stops and buffers such as the keyboard and sound buffers are emptied.

It is possible to change the action of the Escape key so that the buffers are not emptied. To show this type:

### SOUND1,-15,25,255

The noise produced will continue indefinitely. Press Escape and the note stops.

Enter \*FX230,1 and then SOUND1,-15,25,255. Now the Escape key will not stop it!

There are two ways of causing the sound to cease - tapping the Break key or entering \*FX230,0 and then pressing Escape.

If a program is under development then using these calls to change the action of the Escape key can cause problems. They prevent the programmer stopping it to list it or discover the value of the variables that are being used.

If these calls are to be incorporated, then it is best to write them so that they don't

Default or inactive call	Active call
*FX200,0	*FX200,1 disables the Escape key
*FX220,27	*FX220,x moves the Escape key action to key number x
*FX229,0	*FX229,1 causes Escape to generate CHR\$27
*FX230,0	*FX230,1 Escape does not flush buffers

Table I: Active and Inactive Calls

Call	Action
*FX4,0	cursor keys have usual function
*FX4,1	cursor keys generate ASCII characters 135 to 139
*FX4,2	cursor keys are definable *KEY11 onward...
*FX21	clears keyboard buffer
*FX124	used in connection with the
*FX125	Escape key but are only
*FX126	important in machine code work
*FX200,1	disables Escape key action
*FX200,2	causes Break action to corrupt the program
*FX200,3	gives combined action of
	*FX200,1 and *FX200,2
*FX220,x	causes key with ASCII value x to act as the Escape key
*FX129,0	pressing Escape interrupts the processing of the computer
*FX229,1	causes the Escape key to generate the ASCII number 27
*FX230,0	the Escape key action includes flushing buffers
*FX230,1	the Escape key action does not include flushing buffers of their contents
*FX247	used together to change the action of Break
*FX248	by directing the computer to a
*FX249	machine code routine immediately after Break has been pressed
*FX253	used to determine the previous type of Break action
*FX255,x	used to determine the mode the computer automatically goes into after Break.

Table II: \*FX Calls discussed this month



```
10REM PROGRAM III
20MODE2
30*FX4,1
40*FX229,1
50xpos=500
60ypos=500
70MOVExpos,ypos
80speed=10
90REPEAT
100COLR,RND(16)
110inkey=INKEY(1)
120IFinkey=136THENxpos=
    xpos-speed
    130IFinkey=137THENxpos=
        xpos+speed
        140IFinkey=138THENypos=
            ypos-speed
            150IFinkey=139THENypos=
                ypos+speed
                160DRAWxpos,ypos
                170UNTILinkey=27
                180*FX229,0
                190*FX4,0
```

Program III

```
10REM PROGRAM IV.
20MODE2
30colour=RND(16)
40GCOLOR,colour
50GCOLOR,136-colour/2
60COLOUR128+colour
70COLOUR17-colour
80CLG
90*FX229,1
100As="Electron User"
110xpos=500
120ypos=500
130diameter=200
140MOVExpos,ypos
150MOVExpos,ypos
160FDRangle=0T06.6STEP.2
170sin=SIN(angle)*diameter
180cos=COS(angle)*diameter
190PLOT0,sin*cos
200MOVExpos,ypos
210PRINTTAB(2,7)LEFT$(As,
    2*angle);
    220NEXT
    230*FX229,0
    240COLOUR0
    250COLOUR135
    260PRINTTAB(2,29);
```

Program IV

affect the key.

When the program has been thoroughly debugged, then the calls can be put into the active mode. Table I shows what I mean.

We can now turn our attention to the other keys on the keyboard.

The Caps Lk/Func key can be switched on and off without touching it. \*FX202.0 switches the Caps Lock on — the default position and \*FX202.48 switches the Caps Lock — and the light — off. Pressing the letter keys now produces lower case letters.

The cursor keys can be programmed in the same way as the other User Defined keys. However, their normal function of moving the copy cursor around the screen has to be switched off using \*FX4.2.

Try entering these commands and then pressing the cursor keys:

```
*FX4,2
*KEY12LEFT
*KEY13RIGHT
*KEY14DOWN
*KEY15UP
*KEY11COPY
```

Pressing the Copy key will produce the word COPY.

\*FX4.1 causes the Copy and cursor keys to produce Ascii codes from 135 to 139 — See page 280 of the Electron User Guide for further details.

## It's good programming practice to empty the keyboard buffer before all INPUT, INKEY and GET statements

This is an extremely useful technique for games and graphics programs.

Program III shows how the keys can be used to guide an object around the screen.

If a program is running, say drawing shapes on the screen, and the keys on the keyboard are pressed, then the computer stores the value of each key in an area of memory known as the keyboard buffer.

When the program ends or when it reaches an INKEY, INPUT or GET statement, then these previously-typed characters will be entered into

the program or be displayed on the screen.

Sometimes this can cause a problem. For example, on a Space Invader-type game you may have entered five fire presses — the letter A — and

errors of input could occur.

\*FX21 clears the keyboard buffer of all previously entered characters. Program IV demonstrates this.

The computer draws a circle on the screen, the process taking several seconds. Try running the program. While the circle is being drawn tap a selection of keys.

When it has finished the characters you typed will appear at the bottom of the screen. Now add this line to the end of the program:

```
900 *FX21
```

This causes the keyboard buffer to be cleared after the circle has been drawn. Any characters that are typed during the drawing will be lost.

And that's about it for this month. We've seen how we can change the actions of the Break, Escape and Cursor keys. Table II sums it all up.

Next time, we'll look at the \*FX calls that affect the actions of the User Defined keys. We'll also investigate those \*FX calls that are used with a printer. They'll be of special interest to Plus 1 owners.

**Classroom Computing on the Electron consists of 15 full-length programs, all specially chosen to combine educational validity with sheer good fun.**

They range in scope from pre-reading to sixth form maths, and each has been thoroughly tested in the classroom.

The original BBC Micro version was warmly welcomed by teachers and parents, and reports that have come in from all over the country show how well they have proved themselves, both in the school and at home.

Now, in this new version, you can help turn your Electron into a valuable learning centre.

**Please send me:**

☐ Classroom Computing on the Electron (cassette) ..... 3070 ☐ £5.95

☐ BBC Micro Education Special (magazine) ..... 2210 ☐ £1.95

☐ Both the above cassette and magazine ..... 3071 ☐ £7.00

**TOTAL £** .....

☒ I wish to pay by:

☐ Cheque payable to Database Publications Ltd.

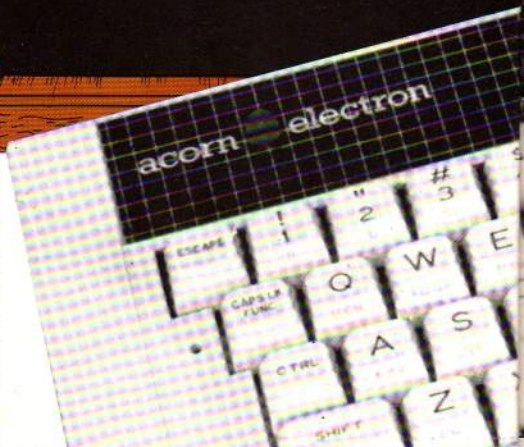
☐ Access Card no. ....

☐ Barclaycard/Visa Card no. ....

Name ..... Signed .....

Address .....

**POST TO: Classroom Computing, Electron User, ..  
68 Chester Road, Hazel Grove, Stockport SK7 5NY**





**15 full-length programs**

designed to stimulate,  
educate and entertain  
— both in school  
and at home

**£5.95** Electron  
cassette

All necessary instructions are contained within the programs themselves, but more detailed descriptions can be found in **The Micro User Education Special**. Originally written for the BBC Micro, it includes complete listings of all the programs, together with advice on how they can be adapted to cater for individual needs.

Book +  
Electron  
cassette  
**£7**

Book  
only  
**£1.95**



## MATHS TRIO

Three invaluable elementary maths programs, which give the child guided practice and also graphically demonstrate the reasoning behind the sums.

**Tuadd:** Teaches how to add up two digit numbers, including carry and is illustrated with animated graphics. At various stages in the addition the child has to tell the Electron what to do next.

**Tusub:** Covers subtracting two digit numbers where the units 'won't go'. The Electron shows the subtraction in all its stages with graphics designed to illustrate the reasons behind each stage.

**Tumult:** Helps with elementary multiplication of two digit numbers — in particular where there are 10s to carry.

**Calculator:** Sums at a stroke! We turn your micro's screen into an easy-to-use calculator.

**Table Mountain:** Despite ever-changing fashions in maths teaching, tables still have to be learned. This program adds a lively new dimension to what is all too often tedious rote.

**Gottit!** An intriguing two player word guessing game packed full of educational potential. Has three levels of difficulty.

**House:** Gentle, pictorial word, number and colour recognition for the very early reader or for those with learning difficulties.

**Gallery:** Based on a shooting gallery, this typing tutor will not only have parents, teachers and children touch-typing with ease — it's fun, too!

**Whatnumber?:** "I'm thinking of a number" is a well known classroom standby. We've taken it much further in this computer version, giving children far more flexibility in their strategy.

**Bridge Breaker:** Find the hidden word before it is too late. This is an exciting and novel way to reinforce vocabulary and spelling skills.

**Snap:** Practice vital pre-reading skills with this letter and number recognition game. Also helps develop coordination.

**Manipulation:** This is a compulsive and thought-provoking maths game. Given the four rules of number and three integers to work with, how close can you get to the target number?

**Matrices:** Takes the calculations out of matrix manipulation, leaving the student free to understand the underlying concepts. (To obtain the fullest benefit from this program see *The Micro User Education Special*.)

**Hidden Answers:** Designed to help primary school children understand a maths learning technique called mapping maths. It explores the ideas of mapping with the use of simple number bonds.

**Curvefit:** Drawing lines of best fit between points, this program will find applications from the infants' class to the sixth form.



# Listings

Save yourself the chore of typing in listings by sending for our monthly tapes, packed with games, utilities, graphics and other programs from the pages of *Electron User*.

ONLY  
£3.75  
each

## On the August 1985 tape:

**DIGGA** Exciting arcade action beneath the earth. **DODGE THE ASTEROIDS** Fun deep in space among the asteroids. **M-CODE** **GRAPHICS** Sliding strips of beer! **\*FX** The OS explored. **MOVEIT** An intriguing sliding puzzle. **HEXGRAM** An educational game to increase your word power.

## On the July 1985 tape:

**MANIC MOLE** Machine code action at its best. **HIGHER OR LOWER** Guess the card. **TIME BOMB** Carefully collect TNT. **M-CODE** **GRAPHICS** Two demonstrations. **FX1/2** The OS on call. **PIRATE** **MATHS** Survive fun. **NOTEBOOK** Password Generator.

## On the June 1985 tape:

**QUASIMODO** Baffling classic. **DISASSEMBLER** Machine code utility. **ACTIVITIES** Educational fun. **REFLECT** Aggressive aliens. **ENGINE** Animation. **DODGE** Race track action. **STRINGALONG** Scrolling fun. **CASTLE** Medieval graphics. **MATHS** Curve Angles and art. **NOTEBOOK** Trees.

## On the May 1985 tape:

**SKRAMBLE!** Compulsive arcade action. **SHEEPIN** The logic game. **TEXTWRITER** Screen utility. **LIFE** A cultured classic. **CEDRIC** Educational fun. **THREE-D** Outstanding utility. **SPOKES** Fascinating graphics. **MOONORBIT** Heavily displays. **BLAZON** Heraldic device. **FLOWERS** A basic bouquet. **NOTEBOOK** Annotated animation.

## On the April 1985 tape:

**SUPER ARCHER** Target practice. **BINARY SEARCH** Search data efficiently. **JOYDD** Switched joystick routine. **ODD ONE OUT** Educational fun. **POLYGONS** 3D rotation. **MONEY CRAZY** Arcade action. **STARCHART** The night sky. **FORTUNE TELLER** Horoscope. **COLLISION DETECTION** Alien invasion. **HILLER** Guessing game. **NOTEBOOK** Hello to assembler.

## On the March 1985 tape:

**MR. FREEZE** Ice cube arcade action. **SCREENDUMP** Two procedures for printer dumps.

## FILLER

The machine code fill routine: **FRED'S WORD GAME** Educational fun. **BIG LETTERS** Large text utility. **PERCY** Beat the burning fuse. **ANIMATION** Two sample programs. **PIGS** Fungus bacon. **NOTEBOOK** Display formatting.

## On the February 1985 tape:

**CRAAL** The mystifying maze adventure. **BOUNCY** Addictively annoying action. **PAIRS** Can you remember the cards? **BASE 4** Binary/hexadecimal conversion utility. **CATCHER** Collect the eggs before they break. **CLOCK** Time-keeping utility. **RACER** Grand Prix action. **NOTEBOOK** Graphics wilderness. **TRIG** All the right angles.

## On the January 1985 tape:

**SPACE BATTLE** Assault the deadly descending aliens. **NEW YEAR** A sound and graphics greeting. **ESCAPE FROM SCARGO** Minefield action. **PIE CHART** Statistics made simple. **CLAYPIGION** An Electron birdhoon. **ORGAN** Music maestro please! **NOTEBOOK** An original program. **RANDOM NUMBERS** Or not so random! **SNAKES** Reptilian arcade action. **CHEESE RACE** Beat rival mice.

## On the December 1984 tape:

**CHRISTMAS BOX** Align the presents logically. **SILLY SANTA** Sort out the muddle. **SNAP** Match the Xmas pictures. **RECOVERY** The Bad Program message tamard. **CAROL** Interrupt driven music. **AUTODATA** A program that grows and grows. **NOTEBOOK** Simple string handling.

## On the November 1984 tape:

**STAR FIGHTER** Anti-aliens missions. **SCROLLERS** Wrap around machine code. **UNBAN SPRAWL** Experimental action game. **SPELL** Alphabetic education. **JUMPER** Level head action. **CAESAR** Code breaking program. **KEYBOARD** Typing game.

## On the October 1984 tape:

**BREAKFREE** Classic arcade action. **ALPHASWAP** A logic game to strain your brain. **SOUND GENERATOR** Tame the Electron's sound channels. **MULTICHARACTER GENERATOR** Complex characters made simple. **RIGEL** 5 Out of 10 of the world graphics. **MAYDAY** Help with your mouse code. **NOTEBOOK** Algorithms and string handling.

## On the September 1984 tape:

**HAUNTED HOUSE** Arcade action in the spirit world. **SPLASH** A logic game for non-swimmers. **SHOWS** How sorting algorithms.

work. **SHORT TIME** The time they take. **CLASSROOM INVADERS** Multiple letters for your scores. **SAILOR** Nautical antics. **MATHS TEST** Try out your mental

## On the August 1984 tape:

**SANDCASTLE** The Electron seaside outing. **KNOCKOUT** Bouncing balls batter brick walls. **PARACHUTE** Keep the skydivers dry. **LETTERS** Jumble letters for your scores. **A SUPER-SPELL** Test your spelling. **ON YOUR BIKE** Pedal power comes to your Electron. **SCROLLER** Slided strings slide sideways. **FLYING PIGS** Bacon on the wing.

## On the July 1984 tape:

**SOLO** A day on the links with your Electron. **SOLITAIRE** The classic solo logic game. **TALL LETTERS** Multiple letters for your scores. **BANK ACCOUNT** Keep track of your money. **CHARIST 3D** graphics. **FORMULAE** Areas, volumes and angles.

## On the June 1984 tape:

**MONEY MAZE** Avoid the ghosts to get the cash. **CODE SNAKE** A mastermind is needed to crack the code. **ALIEN** See little green men - the Electron way! **SETUP** Colour commands without tears. **CRYSTALS** Beautiful graphics. **LASER SHOOT OUT** An intergalactic shooting gallery. **SMILER** Have a nice day!

## On the May 1984 tape:

**RALLY DRIVER** High speed car control. **SPACE PODS** Area alerts to annihilate. **CODER** Secret message mind simple. **FRUIT MACHINE** Spin the wheels to win. **CHASER** Avoid your opponent to survive. **TIC-TAC-TOE** Electron noughts and crosses. **ELECTRON DRAUGHTSMAN** Create and save Electron masterpieces.

## On the April 1984 tape:

**SPACEHIKE** A helping arcade classic. **FRIEZE** Electron wallpaper. **PELICAN** Cross roads safely. **HEXTIMER** Clock your moves. **ASTEROID** Space is a minefield. **LIMERICK** Automatic rhymes. **ROMAN** Numbers in the ancient way. **BUNNYBLITZ** The Easter program. **DOGGDUCK** The classic logic game.

## On the March 1984 tape:

**CHICKEN** Let dangerous drivers test your nerve. **COFFEE** Tantalising word games from Down Under. **PARKY'S PERIL** Parky's lost in an inevitable maze. **REACTION TIMER** How fast are you? **BRAINEASTER** A puzzling program. **COUNTER** Mental arithmetic can be fun. **PAPER, SCISSORS, STONE** Out-guess your Electron. **CHARACTER GENERATOR** Create viruses with this utility.

## On the February 1984 tape:

**NUMBER BALANCE** Test your power of mental arithmetic. **CALCULATOR** Make your Electron a calculator. **DOLLIES** Multi-coloured patterns galore. **TOWERS OF HANOI** The age old puzzle. **LUNAR LANDER** Test your skill at an astronaut. **POSITION INVADERS** A version of the old arcade favourite.

## On the introductory tape:

**ANAGRAM** Sort out the jumbled letters. **DOODLE** Multiple graphics. **EUROMAP** Test your geography. **KALEIDOSCOPE** Electron graphics run riot. **CAPITALS** New upper case letters. **ROCKET, WHEEL, CANDLE** Three fireworks programs. **BOMBBER** Drop the bombs before you crash. **DUCK** Simple animation. **METEORS** Collisions in space.

Use the order form on Page 61



THIS month sees the first of our Adventure Top Tens. All the marks that you've sent in have been averaged out to produce a list of adventures that you think are the best. The result is shown below.

As you can see, Epic Software has done extremely well, deservedly so in my opinion.

Sphinx Adventure, Twin Kingdom Valley and Classic Adventure are the three programs that I get asked the most questions about, so I'm not surprised to see them do well.

One thing that did surprise me was that very few people wrote in with marks for any Scott Adam's games. Maybe that's because they're too engrossed in them to put pen to paper.

Later in the year we'll publish another Top Ten, so keep those marks coming in.

I've had numerous requests for a list of the adventures available for the Electron and so I have compiled one of all those that I have reviewed.

This list is available to anyone on request, provided they send an SAE.

Now on to the problems. Dougie Crouch wants to know whether there is any significance to the description "You are in a wide LANE" after getting the stake in *Sphinx Adventure*. I think this is one part of an anagram, DAVE KNEW being the other part.

Turning to *Castle Frankenstein*, Phillip Dawson wants to know how to attach the rope to the ground after climbing down the castle steps. Also how to get into the room above the sulphur pits.

I don't think he can do either. Does anybody know different?

D. Turner can't befriend Josh or get Eno to read the map in *Suicide Island*. I would like to know who *Suicide Island* is by - I haven't heard of it.

Richard Neuten can't get past the troll in *Classic Adventure*. Give the golden eggs to get across and free the bear to get back. He's also having problems with the clam. Use the trident.

Charles Place wants to



know where the matches are in *Five Stones of Anadon*. Look in the bag in the wizard's bedroom.

*Pettigrew's Diary* has M.A. Evans wanting some help. To get the combination to the House of Phun, read the diary and examine the book titles.

The Barry Manilow room number can be found if you listen to the shady lady's story.

Philip Jong wants to know if there is any way of saving your position in *Sphinx Adventure*.

I seem to remember that a way of doing it on the BBC was described in a recent issue of *The Micro User* but I have not heard of a way of doing it on the Electron. Anyone got the answer?

Still on *Sphinx Adventure*, Alistair Grammer can't get across the troll's bridge without it collapsing. You are not alone!

Darren Marks can only find the lockpick and fuel capsule in *Stranded*. Climb a tree, Darren!

Zalacio the Great (sic) wants to know where the dungeons lead to in *Quest for the Holy Grail*. Only one dungeon is safe to use. Find it and then push the wall.

He also wants to know how to open the safe in *Kingdom of Klein*. Use a key.

R. Gande and Adam Badland are having problems with the dragon and the monastery in *Quest for the Holy Grail*. The dragon dislikes oil and the dungeons are definitely worth exploring.

G.R. Hobson has some questions about *Blue Dragon*. Can you get into the cottage? No. How do you get up the rickety staircase? You can't.

Where is the dragon? A long way away! Use the galley, the boat, then cross the

desert and explore the fort.

Adam Badland and Arif Ali are both still having trouble with that well in *Wheel of Fortune*. Arif seems to be more confused than ever since he read my hints in April's column!

Go down beggars walk, making sure that you pick up everything, then go north to one location past the crossroads and drop the truncheon.

If the policeman finds you with it you'll go to jail and have to restart the game.

Go west for the ladder, then wait one location north of the vending machine. The beggar will walk past you eventually on his way to the machine.

When he comes back north from the machine, give him the penny then go south.

Empty the cup to get the penny, then insert it for a box of matches. Then let the beggar put his penny in the machine and when he has told him to follow you.

Go to the well and get into the bucket, then the beggar will lower you if you ask him.

Finally, I would like to give a very big thank you to John and Eve Thompson for the maps and solutions they kindly sent in.

● If you want Merlin's help write to:

Merlin, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

— and enclose an SAE if you would like a reply.

## ADVENTURE TOP 10

1. *Wheel of fortune*
2. *Kingdom of Klein*
3. *Castle Frankenstein*
4. *Sphinx Adventure*
5. *Twin Kingdom Valley*
6. *Quest for the Holy Grail*
7. *Classic Adventure*
8. *Sadim Castle*
9. *Five Stones of Anadon*
10. *Valley of the Kings*

Epic Software

Epic Software

Epic Software

Acornsoft

Bug-byte

Epic Software

Melbourne House

M&P Software

Softek

M&P Software

**MANY** years ago I remember having a little plastic puzzle made of squares with letters on each one. The object was to move the tiles around until the letters were in the correct sequence.

Now I've brought it up to date with a program that takes all the hard work out of the job.

The puzzle starts with the 15 pieces in a random order on the 4 by 4 grid.

A tile has to be moved into the vacant space, thus creating a new space. A piece can then be moved into that space, and so on until the letters are all returned to their correct position and the space is at the bottom right-hand corner.

The program has been written in a structured way which gives it two benefits.

First, it's easier to understand how it works. The sequence of events is outlined in the first 37 lines.

Second, it's simpler to debug when copying from the page of the magazine as each section of program has a single, identifiable task to complete.

Lines 10 to 370 make up the "control module" which calls all the major procedures and functions. All variables and procedure/function names are given in lower case letters. All number variables are followed by a percent sign, such as `move%`.

Lines 90, 140 and 280 shouldn't be typed in until your program has been thoroughly tested. Line 90 makes sure that the program is not lost if Break is pressed, while line 140 prevents the Escape key from stopping the program.

If Escape is pressed while the puzzle is being played, then the micro plays the moves for you.

Although Mode 1 could have given a greater variety of colours on the screen, Mode 4 had to be used for this puzzle because there's a shortage of memory. The computer will remember up to 4000 moves – that is nearly 4k of memory.

Only two colours are permitted on the screen at any one time in Mode 4. If the chosen colours of black upon red aren't to your liking, then

you can change them at line 120 and 130.

For an explanation of the VDU19 statement see pages 102/103 of the User Guide.

The first Procedure initialises variables and also sets up a machine code routine to print double-height characters.

After the user has entered his or her name, the micro enters a series of nested REPEAT...UNTIL loops.

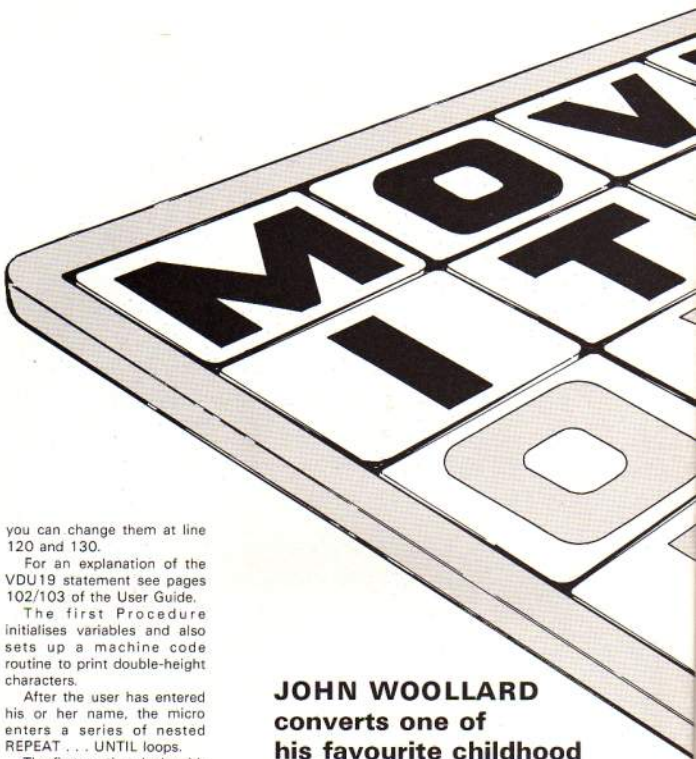
The first section deals with how the computer sets the problem that the user has to solve. The second part deals with how the user solves the problem.

The micro starts with the grid in its final – solution – position and moves pieces in a random way, destroying the pattern.

As it does so, it remembers the moves it is making. The computer therefore knows how to move back to the final solution at any time by making these same moves but in reverse order.

Pieces can be moved into a space in up to four different ways – left, right, up and down. However, if the vacant space is on the top line it's not possible to move a piece down into it.

The Function FNlegal checks to see if a proposed move is legal. It's used both in the first section, when the computer is setting up the



## JOHN WOOLLARD converts one of his favourite childhood games for the Electron

problem, and in the second part, when the user is trying to solve the problem.

The number of moves the computer makes when setting up the problem is proportional to the level of play as shown in Table 1.

The grid is stored in a string variable `grid$` and the final solution stored in `home$`. This final solution is where all the letters are in the correct order and the space is in the last position on the grid. In other words:

```
home$="abcdefghijklmno "
```

The computer knows when the user has reached this position because the contents of `grid$` will equal the contents of `home$`.

After a legal move has been chosen – by the computer in the first part when it is setting the problem, or by the user in the second part – the Electron then operates upon `grid$`, to make it represent the new position.

This is carried out in the procedure PROCupdategrid. The new grid is then displayed by the procedure PROCgrid-display.

The program contains three utilities that you may wish to add to your own programs. They are:

- PROCprint which prints double-height characters in all the graphic modes.
- FNinput which is the same as an INPUT statement in





## From Page 45

```

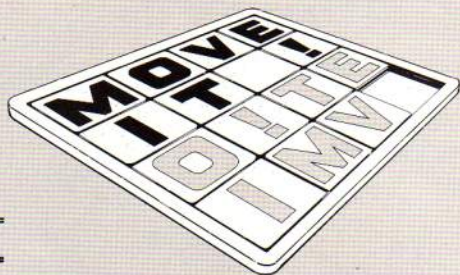
43@home$="abcdefghijklnao
*
440*FX4 1
450FORQut=0TO2STEP2
460P1=dbloX
470q=&FEE
480OPT Opt
490STA&70:STX&79:STY&7A
500LDA#10:LDX#&70:LDY#0:J
SR&FFF1
510LDA#23:JSRq
520LDA#&FF:JSRq
530LDA#71:JSRq:JSRq
540LDA#72:JSRq:JSRq
550LDA#73:JSRq:JSRq
560LDA#74:JSRq:JSRq
570LDA#31:JSRq
580LDA#79:JSRq
590LDA#7A:JSRq
600LDA#&FF:JSRq
610LDA#23:JSRq
620LDA#&FF:JSRq
630LDA#75:JSRq:JSRq
640LDA#76:JSRq:JSRq
650LDA#77:JSRq:JSRq
660LDA#78:JSRq:JSRq
670LDA#31:JSRq
680LDA#79:JSRq
690LDA#7A:ADC#1:JSRq
700LDA#&FF:JSRq
710RTS:J
720NEXT
730ENDPROC
740DEFPROCnamein
750PROCprint(4,2,program$
)
760PROCprint(4,5,"Please
type your name:")
770name$=FINinput
780PROCprint(4,5,STRING$(
35,""))
790PROCprint(4,5,"Type 1e
vel 0 to 9:")
800REPEAT:levelY=ABS(GET-
48)
810UNTILlevelX(10
820PROCprint(4,5,STRING$(
35,""))
830ENDPROC
840DEFPROCautoplay
850REPEAT
860PROCupdatetgrid(5-(goes
X?(goX-1))
870PROCgriddisplay
880UNTILgoX(1

```

```

890PROCendmessage
900RIN
910DEFFNrndmove
920REPEAT
930x1=RD(4)
940UNTILx1+goesX?(goX-1)
<5>
950=x1
960DEFFNlegal(x1,rogueX)
970legalX=1
980IF(rowofholeX=1)ANDx1=
2THENlegalX=0
990IF(rowofholeX=4)ANDx1=
3THENlegalX=0
1000IF(colofholeX=1)ANDx1=
1THENlegalX=0
1010IF(colofholeX=4)ANDx1=
4THENlegalX=0
1020IFlegalX=0ANDrogueXTHE
NPROCprint(4,22,"That's not
legal '":inkeyX=INKEY(99)
1030IFx1=0THENlegalX=0
1040=legalX
1050DEFPROCupdatetgrid(x1)
1060spaceX=INSTR(grid$, "
)
1070IFx1=1THENgrid$=LEFT$(
grid$,spaceX-2)+"*MID$(gr
id$,spaceX-1,1)+MID$(grid$,
spaceX+1)
1080IFx1=2THENgrid$=LEFT$(
grid$,spaceX-5)+"*MID$(gr
id$,spaceX-3,3)+MID$(grid$,
spaceX+4,1)+MID$(grid$,spac
eX+1,3)+"*MID$(grid$,spac
eX+5)
1090IFx1=4THENgrid$=LEFT$(
grid$,spaceX-1)+MID$(grid$,
spaceX+1,1)+"*MID$(grid$,
spaceX+2)
1100colofholeX=INSTR(grid$,
" ")MOD4
1120IFcolofholeX=0THENcolof
holeX=4
1130rowofholeX=INSTR(grid
$, " ")DIV4+1
1140IFgoesX?(goX-1)=5-x1TH
ENgoX=goX-1ELSEgoesX?goX=x1
:goX=goX+1
1150ENDPROC
1160DEFPROCgriddisplay
1170FORcounterX=1TO16
1180LOCALhx,vX

```



```

1190hx=counterXMOD4:IFhx=0
THENhx=4
1200vX=(counterX-1)DIV4
1210PROCprint(4+hX+4,9+vX*
3,MID$(grid$,counterX,1))
1220NEXT
1230PRINTTAB(36,38):goX;"
"
1240ENDPROC
1250DEFFNgetmove
1260*FX21
1270moveX=0
1280REPEAT
1290PROCprint(4,22,"Press
an arrow key")
1300getX=INKEY(999)
1310IFgetX=137THENmoveX=4
1320IFgetX=137THENmoveX=1
1330IFgetX=138THENmoveX=2
1340IFgetX=139THENmoveX=3
1350IFmoveX=0THENVOU7
1360PROCprint(4,22,STRING$(
19," "))
1370UNTILmoveX
1380=moveX
1390DEFPROCendmessage
1400PROCprint(4,22,"That's
the end; play again? Y/N")
1410IFFNyesno=0THENCLS:END
1420PROCprint(4,22,"Will y
ou try a harder problem? Y
/N")
1430IFFNyesno=1THENlevelX=
levelX+1
1440PROCprint(4,22,STRING$(
35," "))
1450ENDPROC
1460DEFPROCprint(x,y,a$)
1470IFA$=""THENENDPROC
1480FORK=1TOLEN(a$)
1490AX=ASC(MID$(a$,K,1))
1500EX=x+K-1
1510Y=y
1520CALLdbloX
1530IFA$=10THENPROCsound
1540NEXT
1550ENDPROC
1560DEFFNinput
1570*FX21
1580z$=""get$=""
1590hxY=POS:vX=VPOS-1
1600REPEAT
1610IFLEN(z$)>1THENVOU7:q
et$=""
1620IFget$=CHR$(127)THENz$=L
EFT$(z$,LEN(z$)-1):get$=""
1630z$=z$+get$
1640PROCprint(hX,vX,z$+"
")
1650get$=GET$
1660PROCsound
1670UNTILget$=CHR$(13)
1680=z$
1690DEFPROCsound
1700LOCALxX,scale$,noteX
1710xX=RD(8)
1720scale$="ACEFJHLN"
1730noteX=4+(ASC(MID$(scal
e$,xX,1))-52)
1740SOUND1,-15,noteX,1
1750ENDPROC
1760DEFFNyesno
1770yesnoX=1
1780REPEAT
1790IFINKEY(-86)THENyesnoX
=0
1800IFINKEY(-69)THENyesnoX
=1
1810UNTILyesnoX(-1)
1820=yesnoX

```

This listing is included in this month's cassette tape offer. See order form on Page 61.



# IT'S GREAT BEING TWO-FACED

## QFS DISK FILING SYSTEM FOR THE BBC MICROCOMPUTER

- Simple installation – plugs into existing empty sockets.
- No soldering required job complete in under 15 minutes.
- Designed to be compatible with most Acorn Disk Software.
- Double Density capacity is 18 sectors per track, giving a massive 1.4 mega bytes.
- QFS kit contains a 16k ROM containing the firmware. A small printed circuit board contains disk controller and associated custom IC. In addition there are a further 7 support IC's and a link to plug into the BBC micro PCB.
- The QFS comes complete with operating manual and full fitting instructions including diagrams.

**QFS**  
**£79.95**  
Inc VAT  
postage & packing  
£1.50 extra

## ELECTRON DISK INTERFACE

- Plugs straight into electron's plus-one expansion.
- Compatible with 5¼" and 3½" disk drives.
- Up to 89 file names can be stored on each disk.
- Interface contains a real time clock/calendar which allows time and date stamping of saved files.
- Interface comes in hard wearing BBC beige cabinet, complete with operating manual.

**ELECTRON INTERFACE**  
**£115.95**  
Inc VAT  
postage & packing  
£1.50 extra

# AND TWICE AS DENSE

Because Cumana's QFS and Electron interfaces are **DOUBLE DENSITY** they provide extra storage capacity and increase file space.



### ORDER FORM

To: CUMANA LIMITED, THE PINES TRADING ESTATE,  
BROAD STREET, GUILDFORD, SURREY, GU3 3BH.  
TEL. 0483 503121.

Please rush me: .....

I enclose cheque/PO\* for ..... or debit

my access/visa card\* no ..... \*Delete as applicable

Name .....

Address .....

**CUMANA®**  
The best name in memory

Now No. 1 BBC  
game on Micro Deal  
Top Fifty chart

# YOU can go for gold ...with the



Fancy pitting yourself against the world's best at this summer's Olympics?

You can do so without going anywhere near Los Angeles — with the most challenging package of programs of 1984.

MICRO OLYMPICS is more than a game. It's a brilliantly written collection of ELEVEN track and field events.

And because we know we're going to sell many thousands of them we've brought the price right down — to just £5.95.

Ever imagined yourself as another Seb Coe? Then try to run against the world record holder at 1500 metres. And if that distance is too much for you then there's always the 100, 200, 400 and 800 metres to have a go at.

Not much good at running? Don't worry, MICRO OLYMPICS has many more challenges for you. Why not try your skill at the high jump or the long jump?

And if you can't beat the computer at running or jumping then you can always throw things around in frustration! The trouble is that it's just as hard to be a champion at the discus, the hammer or the javelin.

And the pole vault takes the event to new heights!

Yes, it's fast, furious fun, pitting yourself against the world's best times and distances on your micro.

You may not be another Steve Ovett or Alan Wells, but with practice you COULD become the Micro Olympics Champion!



Also available from WH Smith  
and all other leading stores



**Play Micro Olympics  
— and let your fingers  
do the running!**

**Send for it today**

Please send me \_\_\_\_\_ copy/copies of  
Micro Olympics

☐ I enclose cheque made payable to  
Database Publications Ltd.  
for £

I wish to pay by

☐ Access ☐ Visa No. \_\_\_\_\_

☐ BBC 'B' cassette £5.95

☐ Electron cassette £5.95

☐ BBC 40-track disc £7.95

☐ BBC 80-track disc £7.95

Please tick box

Expiry date \_\_\_\_\_

Signed \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Post to: Micro Olympics offer, Database Publications,  
68 Chester Road, Hazel Grove, Stockport SK7 5NY.

EUB



# Micro Messages

COULD you please solve this frustrating puzzle for me. It's driving me mad. When I press Shift and Break together it comes up with the message:

**Acorn Electron  
Searching  
File not found  
Basic**

What does this mean? If it is a kind of boot then could you please tell me how to set it up so it does find something.

I also have an answer to Paul Godley's query about Micro Power's Ghouls. To get to the power jewels you have to stand on the block nearest to the jewels and then go as near to the left of the block as you can without falling off.

Then you press "Jump" and "Left" at the same time. This should put you next to the power jewels and then you should go on to the next level.

Thank you Electron User for a top quality magazine that I really look forward to getting every month. — **David Bociek, Marston, Beds.**

● When Shift + Break are pressed with a disc drive attached the disc is searched for a file called IBOOT.

If it finds it, it is \*EXECed, \*RUN or \*LOADed depending on the option set up.

If it can't find it, it reports "File not found".

## More tips for Ghouls

HERE are some tips to help Paul Godley get at the Ghouls treasure.

Screen 1: Stand on the ledge nearest the treasure, with your left leg overhanging the ledge. JUMP and move RIGHT. Hey presto, you've got the treasure!

Screen 2: Jump over to the left of the moving platform. When the platform is returning from under the treasure take a RUNNING JUMP on to the platform then on to the

## Disc drive on a mission impossible

treasure (timing is critical). Success again!

I haven't succeeded yet getting out of Screen 3, but my highest score is 1,238 points. — **Steven Paul Taylor, age 5, Timperley, Cheshire.**

P.S. I asked my daddy to write this letter for me.

● Thanks for the help Steven.

## Surprise package

REGARDING the paragraph in Micro Messages December, 1984 headed "View into the ROM", I carefully typed out the program shown, but to my surprise I got a screenful of information under the heading "Acorn acknowledges" and a long list of names of people etc associated with the Acorn's development.

Fair enough, but I was staggered to see that this information was full of spelling errors, even Acorn was wrongly spelt. Practically every word had some spelling error.

Obviously this has not happened by accident. I wonder what the reason is for this peculiar display? — **Fred T. Wenborn, Romford, Essex.**

● &FC00 to &FEFF is a memory mapped input/output area for hardware devices. If you have anything plugged in to the Electron then data will be read from this, not the OS ROM.

## Case of hunt the bug

I VERY much enjoyed Roland Waddilove's Skramble, it took a lot of typing and debugging,

but I feel you can learn a lot from typing other people's programs.

I have recently obtained a Plus 3 disc drive and find that Skramble will not run with the Plus 3 fitted, nor will programs with DIM statements, but there is a program to download this type of program.

I have tried to download Skramble but it does not work. Could you advise me on this problem?

As more and more people buy disc drives for the Electron the problem of programs not working with the Plus 3 fitted will be more common.

You often ask in your excellent magazine what would we like to read about. My choice would be more information on machine code, which I find very hard to understand. — **P.M. Marsh, Leamington Spa, Warwickshire.**

● Skramble does work with the Plus 3. We suspect there's still a bug or two lurking somewhere in your listing. Please check it carefully.

Our machine code series has now started and part II is contained in this issue.

## Battle in good order

SKRAMBLE is excellent and well worth the effort of typing in and debugging. Please keep including longer machine code listings such as Mr Freeze and Space Battle.

I do not understand assembly language, but find that using REM statements and subroutine names it is not hard to find the part of the listing where the error lies.

By the way, shouldn't

January's Space Battle program have a line 4760 RTS?

Until I added it the base blew up as soon as the first alien was hit. — **D. Goodwin, Cardiff.**

● Space Battle is correct. We suspect you've put a JSR in line 4750 instead of JMP.

## Disabling the Plus 1

I AM writing in reply to David Thompson's letter in the June edition of Electron User in which he says he cannot \*SAVE or \*LOAD his version of Twin Kingdom Valley.

This, as I have found from the same experience, is because he has a Plus 1 fitted. If he removes his Plus 1 he will be able to execute the commands. — **Nigel King, Biggin Hill, Kent.**

● There's no need to remove the Plus 1. It can be disabled quite easily — see Micro Messages in the October 1984 issue of Electron User, where there is a short listing from Micro Power.

## Touch of the blues

STEPHEN Harrop (Micro Messages, June 1985) has a good idea for listing programs in Mode 6 with a blue background and paged mode on, but for this to work you still have to type LIST or L.

My method of doing this is even easier and involves the Break key. All you do is program the Break key with the functions that you want and then press Break when



## From Page 49

you want the program listed.  
To do what Stephen did you just type:

\*K.100.1M:50400:NL.1M

This will then list the program on a blue Mode 6 screen with paged mode on and because of the Acorn Electron message the top line is not used.

IS is the same as VDU19, which changes the background colour. 1N is the same as VDU14 which puts the display in paged mode and 1M is the same as pressing Return. — **Matthew Laverder, Radyr, Cardiff.**

● Thanks for the tip Matthew.

## A little bit off the top...

WHEN I play games on my Electron I can't see the top of the screen. I tried to use \*TV 255 but this didn't work.

Have you any suggestions? — **Daniel Wells, Blisworth, Northampton.**

● Yes, ask a TV engineer to adjust your TV. It's actually very simple and only takes a couple of seconds with a screwdriver, but I wouldn't recommend you do it yourself.

## Positron hot shot

I HAVE not been sure about whether to write or not as I have been using a Quicksort II joystick to get my highest score on Positron. My best so far is 546,780.

The secret is to put the joystick on auto-fire and press Return rapidly at the same time. This gives really fast firing.

Also, one day I tried to load Inheritance for the BBC-B on my Electron. In hexadecimal it went up to 67. The Electron just seemed to overload.

The program wouldn't run and when I tried to list it the computer replied: "No room".

I presume this meant that it had no room left in its RAM to list the program. Why was this? Was it because of the Electron's lack of Mode 7? —

**WHAT would you like to see in future issues of Electron User?**

**What tips have you picked up that could help other readers?**

**Now's here is your opportunity to share your experiences.**

**Remember that these are the pages that you write yourselves. So**

**tear yourself away from your Electron keyboard and drop us a line. And please, if you want a reply, enclose an SAE.**

**The address is:**

**Micro Messages  
Electron User  
Europa House  
68 Chester Road  
Hazel Grove  
Stockport SK7 5NY.**

**Andrew Kerr, Dumfries.**

● The BBC has about 7k more RAM available as Mode 7 takes up a measly 1k against the Electron's 8k Mode 6.

## Round up that memory

I OWN an Electron and Plus 3 expansion and find that I run out of memory very easily when using mode 2.

If possible I would like to increase the memory of my machine to overcome this problem.

I know this can be achieved by adding a second processor, but I don't think I can afford one (and as yet there is no tube interface to fit into the Plus 1).

Is there an expansion board (like the Raven 20 upgrades BBC to 52k computer)? — **C. Smith, Middlesbrough.**

● When the disc interface is fitted PAGE is reset to &1D00 so nearly 4K of memory is lost. The solution is to relocate the program after loading. Function key 0 can be defined to do this when pressed.

```
*KEYB *TAPE:MFORIX=0 TO TOP
STEP4:1X:4E00=1X:4D00:NEX
T:PAGE=4E00:MOLD:NRUN:1M
```

## Suspect tapeheads

PLEASE help! During the last year I have had two tapes, with my own typing of your programs, load perfectly OK — then, after three or four months' use, without reason will not load.

Data? \*\*!?!\* etc. messages

appear on screen.

Thank goodness I have back-ups.

Why does this happen? — **D.L. Cutting, Stowmarket.**

● Try cleaning the tape heads and check their alignment by adjusting them with a small screwdriver while listening to the sound. It should be crisp and clear. The adjusting screw is by the tape head.

## Calling OSWORD

COULD somebody please tell me how you can get sound out of the Electron using Assembly language.

I have tried to take bits out of other programs but I have had no success. — **Adam Hamilton, Cricklade, Swindon.**

● You need to call OSWORD at &FFFF1 with the accumulator set to 7 and the X and Y registers pointing to a parameter block.

Look up OSWORD in the manual for a description of the parameter block.

## Cube root riddle

FOR months I have been trying to find a formula to cube root a number on the Electron, but I haven't succeeded in finding one.

There is a way of finding the square root of a number in the Electron User Guide, but no mention of cube roots. — **Paul Musson, Woodbridge, Suffolk.**

● Are there any mathematicians out there who can help?

## Superstars super scores

WE thought you would like to see some of our high-scores on the highly recommended Brian Jacks Superstar Challenge.

Swimming	14.7 secs.
Canoeing	19.6 secs.
Archery	380 points.
Cycling	12.0 secs.
Running	16.6 secs.
Squat thrusts	79.
Air dms	106.
Football	4 goals (level 4).

Our overall high score is 29,895 (level 6).

We have also obtained 100,000 on Overdrive because after this it goes back to 0.

Everybody seems to be asking "Where are the software charts for the Electron", so we have compiled one ourselves.

1. Elite (Acornsoft).
2. Tempest (Superior Software).
3. Brian Jacks Superstar Challenge (Martech).
4. Zalaga (Aardvark).
5. Mineshaft (Durell).
6. Micro Olympics (Data-base).
7. Mr Wiz (Superior Software).
8. Killer Gorilla (Micropower).
9. Gauntlet (Micropower).
10. Blockbusters (Machen Soft).

— **Paul Rudd and Jamie Pizey, Norwich, Norfolk.**

## Missing the miner

I ONCE owned a Spectrum, but after a while I found out that it was just a large pocket calculator with tiny bits of sponge glued on to it for keys. So I turned to the most magnificent computer around today, that is the Electron.

But I must say that there was one Spectrum game that really interested me and that was Manic Miner, by Software Projects.

I knew that sooner or later there would be a version for the Electron. How wrong I was.

Since then there have been



copies made for other computers like the Amstrad 64k, Oric Atmos, Commodore 64, the BBC Micro and even the Memotech (whatever that is). I feel the Electron is being left out. Can this be true? — K. Majeuadia, London.

● We think you're being a bit hard on the Spectrum, it was excellent value for money in its day. Since the Electron's price reduction it doesn't look so hot.

Alligator's Blegger is better than Manic Miner.

## Racing tips

I HAVE found a way of starting at any stage in Superior Software's Overdrive and to go to the next stage even if your bonus has not reached the blue rectangle.

First type:

```
LOAD"OVERDRIVE"
```

Scrap lines with:

```
*FX200.2
```

or

```
*FX200.0,2
```

(I'm not giving the lines because you can do a bit of detective work for fun!)

Don't load part 2. Type:

```
LOAD "OVER2"
```

List and find the line that says:

```
IF ?BONUS>49 THEN  
?STAGE=?STAGE+1
```

49 means the number of cars you have to pass to get to the next stage. Lower the number to something like 10. At the beginning of the program you should find:

```
?STAGE=1
```

If you want to start at snow change it to:

```
?STAGE=3
```

After all these changes, save it a "OVER 2" on a blank tape.

Now turn the computer off and on. Load parts 1 and 2 then load the saved program

and after all that then load part 4.

Happy racing! — David M. Molyneux, Chelmsford, Essex.

## Bleeping routine

I WAS messing about with machine code routines on my Electron and I wondered if I could come up with one to make the keys bleep every time I touched them. I came up with this:

```
1REM BLEEP  
2REM Tony Remmer  
10P%=470  
20?%220=PX MOD 256  
30?%221=PX DIV 256  
40C  
50LDA #607  
60JSR @FFEE  
70RTS  
80J
```

After typing it in, you next type in these \*FX commands: \*FX 214.1, \*FX 213.200, \*FX 14.2.

When you run the program a bleep will occur every time you press a key. — Tony Remmer.

## Understanding Plus 3

I AM the owner of a Plus 1 and a printer and am also lucky enough to have the new Plus 3. But this is causing me a few headaches.

Having a reasonable grasp of Basic, I hoped to be able to use the Plus 3 with reasonable ease. Alas not. Well written the User Guide may be, but I regret I cannot fully understand it, nor use the disc drive properly.

I have also come across problems with programs I previously had on tape — both shop bought and copied from your magazine.

The main problem is the page space that the Plus 3 chip takes up. I have read and reread the handbook but cannot find how to alter the page.

Am I looking in the right

# Nice one, Matthew

IN READING your March issue featuring the Plus 3 on page 34 you state that with tape it could literally take hours to copy the screen contents.

I have come up with a method which works like Spectrum screen S. You type in the graphics program — I drew a wine bottle — then:

```
*SPOOL "name"  
RUN
```

The program is saved as a file.

To run it, type:

```
*EXEC name
```

My program took two seconds to load. The program took 30 seconds to load

normally.

Could you give me some details of printers under £200. I am looking at the Brother HR-5 and Mannesman Tally. — Matthew Laycock, Stockfield, Northumberland.

● Thanks for the screen saving tip. It's so simple it's brilliant. Everyone's kicking themselves for not thinking of it.

The Brother HR-5 is a good printer if you simply want to list programs and produce screen dumps.

We haven't tried the other so we can't say what it's like.

Find a shop which sells both and compare a sample of their printing if possible.

## Accent on education

I HAVE read with great interest your articles on educational software.

I am mid-30s and that was the sole purpose of buying the Electron — to further my education from home via my computer, but as the articles say, we can't get hold of any.

I enquired about ordering it at Boots but they won't do it. The games they stock are on a sale or return basis and the educational ones have to be bought outright.

Looking back through 12 months Electron Users every now and again there is a mention of an educational program.

You have Classroom Computing in this month which we can send for (and I have), so what I would like to know is why on earth can't you use Electron User to promote and sell educational programs?

Or at least give us information on what is available for all ages and names and addresses of firms willing to do mail-order. — Miss S. Robinson, Hinckley, Leics.

● We'll be publishing a list of educational software fairly soon. Electron User probably publishes more educational programs for the Electron than any other magazine.



# DISC POWER

## AT A NEW LOW PRICE!

NOW it's cheaper than ever to add the power of discs to your Electron Plus 1 – with the Cumana floppy disc system.

Easy to fit and simple to use, the Cumana system has the latest and most flexible DFS for the Electron – and much more besides.

It consists of an interface, electronics and software in a cartridge, a single 5¼in disc drive with lead and a utilities disc.

The interface slots into the Plus 1's cartridge port. Up to

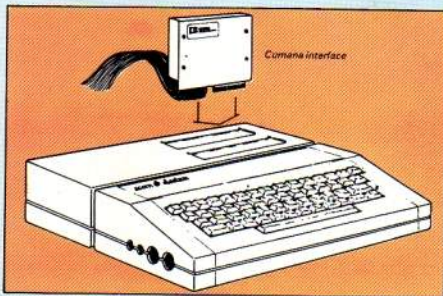
two 3½in or 5¼in disc drives can be attached. The result is a whole new dimension of speed and reliability!

#### Its advanced features include:

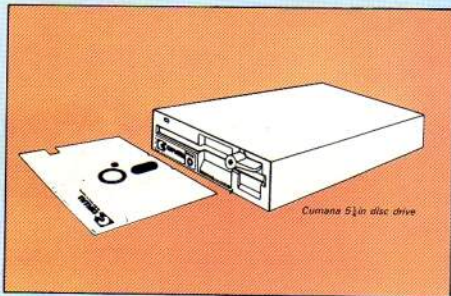
- Fast, reliable storage of programs, word processor files and databases.
- Double density format to maximise use of the discs.
- A complete set of commands for efficient disc management.
- Easy transfer from tape to disc. The DFS uses no precious RAM.
- Random access files for more advanced data storage.

- The ability to read programs from both BBC Micro single density discs and from the Plus 3 ADFS discs.
- A utilities disc packed full of useful programs, including a verify routine, formatters, copy and backup routines and a powerful disc editor.
- A thorough, straightforward manual.

When you add to this the fact that the cartridge has a built in real time clock and a ROM socket (for additional software on a chip) then you'll realise why the Cumana floppy disc system has been so warmly welcomed by Electron users.



Cumana interface



Cumana 5¼in disc drive

- ☐ Please send me the Cumana Floppy Disc System  
(@ £224.15 (inc. VAT & p&p) 3073

Payment: please indicate method (✓)

- ☐ Access/Mastercard/Eurocard

No. \_\_\_\_\_

- ☐ Barclaycard/Visa

No. \_\_\_\_\_

- ☐ Cheque/PO made payable to Database Publications Ltd.

Name \_\_\_\_\_ Signed \_\_\_\_\_

Address \_\_\_\_\_

Send to: Database Publications, FREEPOST,  
Europa House, 68 Chester Road, Hazel Grove,  
Stockport SK7 5NY.

(No stamp needed if posted in UK)

Please allow 28 days for delivery

You can  
also order  
by phone

061-480 0171

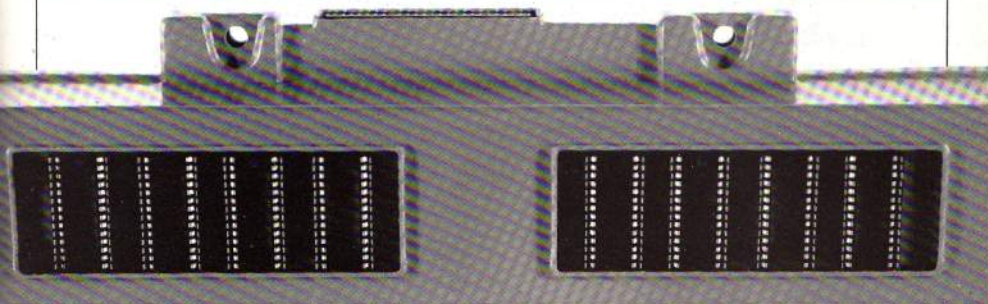
24 hours

Don't forget to quote your  
credit card number and  
give your full address or use  
the order form on Page 61.

EU5

**Save £45**  
on the  
**Cumana  
floppy disc  
system**  
RRP £269.90  
**OUR PRICE £224.15**  
inc. VAT





## Using all the Plus 1's slots?

# The Rombox gives you room for eight more ROMs

**THE Electron's operating system, like its big brother the BBC Micro, is capable of managing up to 16 sideways ROMs.**

These ROMs can contain a variety of software such as word processors, games, languages, tools and utilities.

Plus 1 owners will be familiar with this facility as two sockets are provided beneath the spring-loaded flaps on top of the expansion unit for ROM cartridges.

These are fine, but what about the other 14 sockets? Where are they and can we use them? Unfortunately Acorn haven't provided space for more than two ROMs to be plugged in at once.

The BBC had the very same problem when it came out. It was solved by the addition of ROM boards, either internal or external, which provided space for the extra ROMs.

Now Slogger has produced a Rombox for the Electron that enables owners to plug in up to eight additional ROMs. This will allow firmware (software in ROM), written specifically for the Electron, and some BBC ROMs to be used.

The unit is constructed of fairly tough plastic, not quite

the same creamy colour as the Electron. It's the same height and width, but only one third as deep.

Installation is a piece of cake. It simply plugs into the back of the Electron in the same way as the Plus 1. Two plastic screws are provided to secure it firmly.

If you already have a Plus 1 and/or a Plus 3 there's no need to worry. The expansion bus is continued at the back of the Rombox for them to plug into.

The unit is compatible with both expansion units and I've had no trouble with either.

In fact the only problem is that with the Rombox, Plus 3 and Plus 1 the Electron is nearly one and a half feet deep.

Those stories about it getting so big it's falling off the back of the desk are true!

As I said earlier, the operating system can manage up to 16 ROMs, which it numbers 0-15. But not all these are available to the user, as some are already taken up.

Basic occupies 10 and 11, and the keyboard, strangely, is

treated as sideways ROMs 8 and 9. The Plus 1 operating system is 12, and the ROM cartridge sockets are 0 and 1. The ADFS in the Plus 3 is number 4. So what does this leave?

With both Plus 1 and 3 attached there is room for eight more ROMs, exactly the number of places available on the Rombox.

However it's not that simple. The ROMs are in two banks of four. The left four are fixed as ROMs 4-7. So if you have a Plus 3 then the first ROM position, 4, is unavailable, although 5, 6 and 7 are OK.

The right bank of four can be set as 0-3 or 12-15. As 0 and 1 are for ROM cartridges it seemed best to have them set up as 12-15. This left 13, 14 and 15 free, as 12 is the Plus 1.

So, with an unexpanded Electron all eight ROM positions are available. But with both Plus 1 and 3 only six are free.

I have three ROMs in use at present - Vine Micros'

Addcomm and Slogger's own Starmon and Ekman. All work perfectly with no apparent bugs or hiccups.

It's surprising just how many ROMs are available now for the Electron. You could easily fill all the sockets.

An added bonus with the Rombox is the option to use the rightmost ROM position as a sideways RAM socket.

The extra RAM available would not increase the amount of memory available for running programs, but it would allow data to be stored there.

It would even be possible to save ROMs to disc and load them into the sideways RAM as and when needed, thus freeing ROM sockets.

Slogger has produced a valuable piece of hardware which enables the Electron to use its ability to access sideways ROMs to the full.

The Rombox fits in nicely with the Plus 1 and Plus 3, or can be used on its own.

My only criticism is that the ROMs are rather exposed. I would have preferred them to be under some sort of cover, but this is a minor point and I can't really find fault with its operation.

By ROLAND WADDILOVE

# Test your word power

A compulsive educational board game by **ANDREW KANE**

**HEXAGRAM** was written originally for children. I had earlier written one or two educational programs for my young son but he quickly tired of them because there was no game element in them.

Hexagram now overcomes this by producing anagrams coupled to a board game which suits both child and adult players.

Two levels of play allow children to play adults as well as other combinations. The game helps with word recognition, spelling and vowel/consonant sequence.

A 4 x 4 grid of hexagons appears on the screen, each containing a letter. The players are coded blue and white. The text appears in these colours alternately to indicate the sequence of play.

The player selects a letter. A word starting with that letter appears in anagram form.

A clock starts the countdown from 60 seconds, during which time the anagram must be solved.

For a correct answer the hexagram containing the selected letter changes to the player's colour.

The first player to create a path across the screen - the

blue player - or down the screen - the white player - is the winner. Blocking tactics can be employed.

The words are rearranged in memory during play so that they can only be encountered again after five selections of the same letter.

The text remains on screen for several seconds at each stage of the game so that children - and adults! - can read and learn the correct answers.

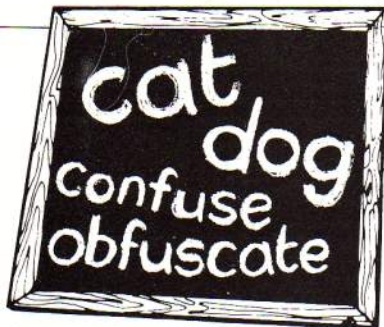
If instead of the *Electron* the game is played on a BBC Micro you may need to change `PROCwait(J%)` to increase the time span. Also `VDU 23,1,0,0,0,0` must be switched to `VDU 23,8202,0,0,0`.

The data is plentiful. A total of 230 words are used, but this ensures an interesting competitive game. The words can be changed readily.

Young children may need three and four-letter words. Do not exceed eight letters or problems of screen layout may occur.

Try to avoid anagrams with more than one solution - such as one for **QUITE** which could be **QUIET**.

The most complex aspect of the program is the routine to check for a winning line.



Initially I was tempted to allow the players to determine if there was a winner, but I felt this was ducking the issue.

The outcome is about 60 lines of program split into seven procedures.

There are scores of winning paths, some being very serpentine, so a complicated analysis routine was required.

## METHOD OF CHECKING FOR WINNING LINE

A TWO-dimensional grid is stored in memory. Imagine it to look like Figure 1.

Before the game starts some locations outside the playing area are filled with value 1 (line 970) to assist the checking routine.

Each correct reply from the players is placed on the grid as value 1 or 3, depending on the colour of the player.

The computer, when checking vertically for a winning line, searches row 1 for a 3 and

drops down to row 2 if successful. If unsuccessful it aborts the routine.

It then looks either side of that column which in row 1 contained a 3. It continues to do this until row 5 is reached, whereupon it declares a winning line.

If a dead end is found it changes the numbers in the grid leading to the dead end - and restores their values after completing the check.

The routine is now repeated, without that dead end, until a route is found or not found.

Extra routines are required when checking vertically since a winning line may move down, up and down a series of columns between rows 1 and 5 - hence `PROCup`.

The horizontal checking routine is similar. Column 1 is checked for a 1 and then the adjoining rows are scrutinised as described earlier.

`PROCdiag` checks for unusual winning lines by the BLUE player.

## Hexagram listing

```

10 REM Hexagram
20 REM By Andrew Kane
30 REM (c) Electron User
40 ON ERROR GOTO 3100
50 IF PAGE>6000 PROCReLo
cates:END
60 *KEY10 OLDIM RUNIM
70 *FX11,0
80 *FX4,1
90 *FX202,176
100 *FX210,0
110 MODE1
120 PROCIntro
130 MODE5
140 PROCInit
150 PROCLink

160 PROCscreen
170 A2=AND(2):Q7=A2*2:R
EM player to start
180 REPEAT
190 PROCchoose
200 UNTIL W2=1
210 GOTO150
220 END
230 DEFPROCinit
240 VDU23,1,0,0,0,0;
250 ENVELOPE1,0,9,25,17,2
46,68,60,126,0,0,-126,126,1
26
260 ENVELOPE2,0,1,102,42,
159,176,87,126,0,0,-126,126
,126
    
```

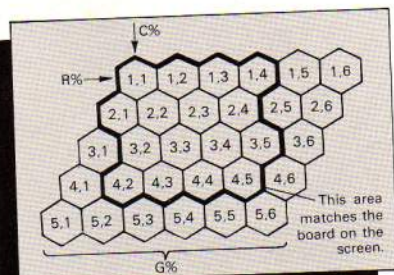


Figure 1



## PROCEDURES

<b>init</b>	Sets up user defined characters, sets aside memory for words and variables and stores these.
<b>screen</b>	Draws the game board, fills hexagons with random letters.
<b>edge</b>	Draws game board back ground.
<b>hex()</b>	Draws hexagons at specified coordinates in specified colour.
<b>randlet</b>	Randomly fills hexagons with 16 of first 23 letters of alphabet.
<b>choose</b>	Asks for letter choice, finds a word in memory beginning with that letter, determines order of play.
<b>scramble</b>	Forms anagram of word, ensures it is an anagram, shows the clock, accepts reply, reorders words in memory to prevent immediate repetition if reply wrong.
<b>checkver</b> <b>branch</b> <b>linear</b> <b>up</b> <b>checkhor</b> <b>across</b> <b>diag</b>	Seven procedures to check for the winning line.
<b>right</b>	Declares correct reply, changes colour of hexagon.
<b>wrong</b>	Declares wrong reply, gives correct reply.
<b>timeup</b>	Declares time up, gives correct answer.
<b>win</b>	Declares a winner, causes colour flash on game board.
<b>wait(J%)</b>	Delays game to allow reading time.
<b>intro</b>	Describes the game, asks for levels of play.
<b>link</b>	Summarises instructions before and between games.

## VARIABLES

<b>xpos%, ypos%</b>	Coordinates of hexagon centres.
<b>let%</b>	Numbers for letters used in game 1-23 (not x,y,z).
<b>G%(R%, C%)</b>	Two-dimensional grid in memory only to check for winner.
<b>cos%, sin%</b>	Values to enable hexagons to be drawn in segments.
<b>int%, seg%</b>	Sequential integers used in FOR ... NEXT loops.
<b>num%, loop%</b>	Colour of hexagon.
<b>col%</b>	Temporary store for num%.
<b>store%</b>	Words used in the game.
<b>word%</b>	Individual letter store of word to be scrambled.
<b>chr\$</b>	Letter chosen by player.
<b>let\$</b>	Stores the answer one letter at a time.
<b>store\$</b>	Stores letters previously selected to check illegal moves.
<b>file\$</b>	Stores player's answer.
<b>reply\$</b>	Stores letters in hexagons to check for illegal choice.
<b>keep\$</b>	Temporary store for letters during scrambling routine.
<b>T\$</b>	Takes value 1 when winning line occurs.
<b>W%</b>	Colour of current player.
<b>Q%</b>	Determines order of play at start.
<b>A%</b>	Sequential integers in FOR ... NEXT loops.
<b>I%</b>	Temporary store for C%, also used as sequential integer.
<b>L%</b>	Flag to cause changes in checking routine.
<b>T%</b>	Codes for whether easy or hard words selected.
<b>F%, E%</b>	Row number of grid for checking for winning line.
<b>R%</b>	Column number of grid for checking for winning line.
<b>C%</b>	Flag to indicate a successful search around one hexagon.
<b>S%</b>	

```
270 ENVELOPES,0,122,96,77
,7,243,236,126,0,0,-126,126
,126
```

```
280 VDU23,249,0,0,16,56,1
24,16,16,16
```

```
290 VDU23,250,0,12,6,127,
6,12,8,0
```

```
300 DIMword$(230)
```

```
310 DIMchr$(8)
```

```
320 DIMxpos%(16), ypos%(16)
```

```
330 DIMlet$(23)
```

```
340 DIM GX(5,5)
```

```
350 DIMcos%(6), sin%(6)
```

```
360 FORseq%=1 TO 6
```

```
370 cos%(seq%)=COS(PI/3*seq%)
```

```
eg%)*100
```

```
380 sin%(seq%)=SIN(PI/3*seq%)
```

```
eg%)*100
```

```
390 NEXT
```

```
400 FORint%=1 TO 16
```

```
410 READxpos%(int%), ypos%(int%)
```

```
420 NEXT
```

```
430 DATA386,600,578,800,7
```

```
70,800,962,800
```

```
440 DATA290,640,482,640,6
```

```
74,640,866,640
```

```
450 DATA386,480,578,480,7
```

```
70,480,962,480
```

```
460 DATA290,320,482,320,6
```

```
74,320,866,320
```

```
470 FORnum%=1 TO 23:READwo
rd$(num%):NEXT
```

```
480 DATAanimal, angry, acro
```

```
ss, again, alive
```

```
490 DATAbarrel, before, beg
```

```
in, blood, bottle
```

```
500 DATAcastle, circus, cor
```

```
ner, crumb, cream
```

```
510 DATAdanger, decide, don
```

```
key, during, double
```

```
520 DATAearth, empty, expec
```

```
t, engine, eight
```

```
530 DATAfamily, father, fin
```

```
ger, flash, flower
```

```
540 DATAqarage, giant, glas
```

```
s, greedy, grape
```

```
550 DATAhandle, horse, hung
```

```
ry, heavy, hatch
```

```
560 DATAigloo, insect, isla
```

```
nd, invite, indeed
```

```
570 DATAjacket, jolly, juic
```

```
e, jumper, jail
```

```
580 DATAkettle, knife, kitt
```

```
en, knee, kitchen
```

```
590 DATAladder, large, laug
```

```
h, learn, little
```

```
600 DATAmagic, music, march
```

```
, middle, mother
```

```
610 DATAnarrow, night, nort
```

```
h, nurse, never
```

## Are YOU a first rate PROGRAMMER?

**Then join the Professionals!**

Award-winning Database Software needs more programmers, both for freelance work and permanent positions.

Applicants must be fluent in both Basic and machine code on at least one of the popular micros, and preferably have experience of others.

Experience in the software industry is not essential, but obviously candidates must have written good quality software in the past and samples will be required.

Pay is negotiable, depending on age, experience and qualifications. There are excellent prospects for hard working, skilful programmers.

Please send SAE, CV and an example of your work which will be returned unopened to:

**Peter Davidson, Software Manager, Database Software, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.**

## BBC/ELECTRON PROFESSIONAL SOFTWARE

Our educational software is used in thousands of schools and homes throughout Great Britain.

### EDUCATIONAL 1

BBC/ELECTRON

Tape £8.00 Disc £10.00

Hours of fun and learning for children aged five to nine years. Animated graphics will encourage children to enjoy counting, maths, spelling and telling the time. The tape includes six programs: MATH 1, MATH 2, CUBECOUNT, SHAPES, SPELL and CLOCK.

... 'An excellent mixture of games'. Personal Software - Autumn 1983.

### EDUCATIONAL 2

BBC/ELECTRON

Tape £8.00 Disc £10.00

Although similar to Educational 1 this tape is more advanced and aimed at seven to twelve year olds. The tape includes MATH 1, MATH 2, AREA, MEMORY, CUBECOUNT and SPELL.

### FUN WITH NUMBERS

BBC/ELECTRON

Tape £8.00 Disc £10.00

These programs will teach and test basic counting, addition and subtraction skills for four to seven year olds. The tape includes COUNTING, ADDING, SUBTRACTION and an arcade type game called RACKET MATHS which will exercise addition and subtraction. With sound and visual effects.

These are excellent programs which teachers on the project have no hesitation in recommending to other teachers. ... Computers in Classroom Project.

### FUN WITH WORDS

BBC/ELECTRON

Tape £8.00 Disc £10.00

Start your fun with alphabet puzzle, continue your play with VOWELS, learn the difference between THERE and THEIR, have games with SUFFIXES and reward yourself with a game of HANGMAN.

... 'Very good indeed' ... A&B Computing - Jan/Feb 1984

### JIGSAW AND SLIDING PUZZLES

by P. Warner BBC/ELECTRON

Tape £7.95 Disc £9.95

There are two jigsaw and four sliding puzzles on a 3 x 3 and 4 x 4 grid. Each program starts off at an easy level to ensure initial success but gradually becomes harder. It helps children to develop spatial imagination and in solving problems. The tape includes: OBLONG, JIGSAW, HOUSE, NUMBERS, CLOWN and LETTERS.

**\*\*SPECIAL OFFER\*\***

Buy three titles and deduct £4.00

Add 50p p&p per order. Please state BBC or ELECTRON or 40 or 80 track for discs.

Golem Ltd, Dept E, 77 Qualitas, Bracknell, Berks RG12 4QG. Tel: 0344 50720

# BOBBY CHARLTON SOCCER

**For BBC Model/B and Acorn Electron**

**"It's the best computer soccer game I have ever seen"**

**Adrian Heath - Everton F.C.**

Full Arcade-action Soccer Game - YOU build your teams.

- then YOU play Soccer.

Package contains two modules - MANAGER Module and MATCH-PLAY Module.

#### Manager Module Features:

- Select 4-4-2, 4-3-3, 4-2-4 or Sweeper System.
- Decide Separate SKILL, ACCURACY and STAMINA levels and any special field positions for each of your eleven men.
- Pre-match injuries (optional - allocated by computer) affect players' performance.
- Select 2-player game, or 1 player v. computer, or computer v. computer.

#### Match-Play Module Features:

- Full 22-man Soccer action - in 3D perspective.
- YOU control the men - Tackle, Dribble, Pass, Shoot and SCORE!
- Use joysticks OR keyboard to vary pace and direction of men and ball.
- Includes Corners, Throw-ins and Goal-kicks and variable-height passes etc.
- Play anywhere from 3 to 45 minutes each way.

There is no other computer football game to match the realism of BOBBY CHARLTON SOCCER. Introduction and playing tips recorded on cassette by Bobby Charlton.

**"We've worked hard for a year now and we've produced what we think is a fantastic game. It's very realistic, the players can move individually from the joystick ... they can pass and they can shoot ..."**

**Bobby Charlton**

**£11.95** Package with Manager Module and Match-play Module **£11.95**

Available through all computer specialists or direct from DACC (post free).



**From DACC**

Name (BLOCK LETTERS) \_\_\_\_\_

Address \_\_\_\_\_

County \_\_\_\_\_

Postcode \_\_\_\_\_

Please send me \_\_\_\_\_ copies of the Bobby Charlton

Soccer Game from DACC at \_\_\_\_\_

My computer is a \_\_\_\_\_

I enclose cheque/Postal Order for the total of \_\_\_\_\_



You may order with Access or Barclaycard, either by post or 24hr. telephone (0942) 522002.

Please debit my account no. \_\_\_\_\_

Despatch within 48 hours.

**dacc**  
LIMITED

To: DACC Ltd (Dept E) (85),  
77 Qualitas Road, Redley,  
Wigan, Lancashire  
WN2 3BH.

**EXTRA MODULES AVAILABLE SOON!**  
The **World Cup Module** and the **Canon League Module** will be created by Bobby Charlton's knowledge of individual players and teams.



## Hexagram listing

### From Page 55

620 DATAoffice,organ,other,object,order  
630 DATApoint,parcel,pencil,clinic,please  
640 DATAquart,quill,quote,quarter,quest  
650 DATArabbit,ready,rightround,rubber  
660 DATAscarf,school,sense,shake,sister  
670 DATAtable,teacher,theretiger,tulip  
680 DATAuly,uncle,unkind,upon,useful  
690 DATAvoice,value,view,vacant,vase  
700 DATAwagon,wearw,weight,whale,world  
710 DATAabstract,abandon,adjust,admire,arrive  
720 DATAbelieve,bacteria,bungalow,boundary,boredom  
730 DATAchalice,calendar,cistern,collide,cabinet  
740 DATAdeedonate,daughter,doleful,diagonal,describe  
750 DATAencircle,educate,eminent,exclaim,eternal  
760 DATAflexible,festival,fountain,finger,finance  
770 DATAgenuine,generate,gallery,govern,glisten  
780 DATAhorizon,historic,harmony,hypnotic,herald  
790 DATAimprison,ignorant,incident,industry,idealist  
800 DATAjocundry,joineer,jeweller,journey,junction  
810 DATAknapsack,kilogram,kitchen,kangaroo,kingdom  
820 DATAinament,leather,liberal,lecturer,listener  
830 DATAmystery,molecule,material,mischief,mortgage  
840 DATAnuisance,nervous,nickname,notable,netball  
850 DATAordinary,obligate,official,operate,oriental  
860 DATApanphlet,particle,practise,pheasant,peculiar  
870 DATAquotient,question,quantity,quiver,quarter  
880 DATArelent,restful,reason,riddle,rainbow  
890 DATAserene,sackful,s

ection,separate,sharpen  
900 DATAteenager,terminal,theatre,torpedo,tactless  
910 DATAunknot,umbrella,uniform,urgent,useful  
920 DATAvaccinate,vaccine,valliant,vehicle,victory  
930 DATAwithout>window,weather,whisker,welcome  
940 ENDPROC  
950 REM sets up game board  
960 DEFPROCscreen  
970 GZ(1,5)=1:GX(2,5)=1:GX(3,1)=1:GX(4,1)=1  
980 WZ=0:file\$=""  
990 PROCedge  
1000 FORint=1TO16:PROCedge(xpos(int),ypos(int),2):NEXT  
1010 PROCrandlet  
1020 ENDPROC  
1030 REM draws background  
1040 DEFPROCbg  
1050 VDU19,1,6,0,0,0:GCOLOR  
1060 COLOUR2:PRINTTAB(6,1)"HEXAGRAM"  
1070 MOVE114,950:MOVE290,650:PLOT85,114,170:MOVE290,280:PLOT85,290,850  
1080 MOVE114,950:MOVE962,750:PLOT85,114,170:MOVE962,270:PLOT85,962,750  
1090 GCOLOR,3:MOVE114,950:MVE290,850:PLOT85,114,950:MOVE1048,850:PLOT85,290,850  
1100 MOVE114,170:MOVE376,270:PLOT85,114,170:MOVE962,270:PLOT85,376,270  
1110 ENDPROC  
1120 REM hexagon created  
1130 DEFPROCedge(xpos(int),ypos(int),col)  
1140 VDU29,ypos(int),xpos(int):VDS(int):NEXT  
1150 MOVE0,100  
1160 GCOLOR,col  
1170 FORseq=1TO6  
1180 MOVE0,0  
1190 PLOT85,sin(seq),cos(seq)  
1200 NEXT  
1210 VDU26,28,0,31,19,28  
1220 ENDPROC  
1230 REM fills hexs with letters

1240 DEFPROCrandlet  
1250 FOR i=1TO23:let%(iX)=iX:NEXTFOR i=23TO2STEP-1:GX=RDND(iX):TX=let%(GX):let%(GX)=let%(iX):let%(iX)=TX:NEXT  
1260 VDUS=GCOLOR,0:keep\$=""  
1270 FOR num=1TO16:MOVExpos(num)+20,ypos(num)+10:PRINTCHR\$(let%(num)+96):keep\$=keep\$+CHR\$(let%(num)+96):NEXT  
1280 VDUA  
1290 ENDPROC  
1300 REM letter chosen & word found  
1310 DEFPROCchoose  
1320 COLOURZ  
1330 +FX15,1  
1340 INPUT"Choose a letter...":let\$  
1350 IF LEN(let\$):THEN CLS:GOTO1340  
1360 IF INSTR(keep\$,let\$)=0:THEN CLS:GOTO1340  
1370 IF INSTR(+file\$,let\$)>0:THEN CLS:GOTO1340  
1380 IF GX=3AND EX=10R GX=1AND FX=1:THENnum=1  
1390 IF GX=3AND EX=20R GX=1AND FX=2:THENnum=16  
1400 FORint=numTO230  
1410 IF ASC(word\$(int))=ASC(let\$):THEN num=int:PROCscramble:let%=230  
1420 NEXT  
1430 QX=(QX+1)+4  
1440 REM words in memory rearranged  
1450 store\$=""  
1460 word\$(num)=word\$(num)+1  
1470 FORint=1TO3:word\$(num)+intX=intX+1  
1480 word\$(num+4)=store\$  
1490 ENDPROC  
1500 REM letters of word rearranged  
1510 DEFPROCscramble  
1520 CLS:store\$=""  
1530 FOR i=1TO LEN(word\$(num))  
1540 chr\$(i)=MID\$(word\$(num),i,1)  
1550 NEXT

1560 FOR i=1TO LEN(word\$(num)):TO2STEP-1  
1570 CX=RDND(i):T\$=chr\$(CX):chr\$(CX)=chr\$(i):chr\$(i)=T\$:NEXT  
1580 FOR i=1TO LEN(word\$(num)):store\$=store\$+chr\$(i):NEXT  
1590 IFstore\$=word\$(num):THEN GOTO1520ELSE PRINTstore\$  
1600 FORloop=1TO LEN(store\$):IF MID\$(store\$,loop,1)=let\$THEN VDUS1,loop-1,1,249:loop=LEN(store\$):1610 NEXT  
1620 VDUS1,11,0,250  
1630 REM clock routine  
1640 reply\$=""  
1650 REPEAT  
1660 store\$=INKEY(96)  
1670 PRINTTAB(7,3):INT(61-TIME/100):"sec"  
1680 IFstore\$=130Rstore\$=170R GOTO1740  
1690 IFstore\$=127THENreply\$=MID\$(reply\$,1,LEN(reply\$)-1):GOTO1720  
1700 IFstore\$=970Rstore\$=122THEN GOTO1730  
1710 reply\$=reply\$+CHR\$(store\$)  
1720 IF LEN(reply\$):THENreply\$=MID\$(reply\$,1,8)  
1730 PRINTTAB(11,8):reply\$+" "  
1740 UNTILstore\$=130R TIME>6000  
1750 IF TIME>6000THEN CLS:PROCtimeup:CLS:GOTO1770  
1760 IFreply\$=word\$(num):THEN CLS:PROCright ELSE CLS:PROCwrong  
1770 FOR i=1TO8:chr\$(i)=let\$+1:NEXT  
1780 ENDPROC  
1790 REM 7 PROCS to check for winner  
1800 DEFPROCchecker  
1810 RX=1:LX=0:WX=0:GX=1:T  
1820 REPEAT  
1830 IF GX=0THEN RX=1:LX=0:TX=0  
1840 IF RX<1THEN1900

# FOR CONNOISSEURS OF ACTION, LEISURE OR LEARNING

BBC Electron

**ANSWER BACK Sports**  
Game £9.95  
(ages 14 and over)  
Challenge the KOSMOS  
team of football or  
tennis. But be warned, we  
don't lose easily...  
- **NEW RELEASE**  
Whatever your sport,  
this program probably  
knows a lot more than you do!  
**ANSWER BACK Junior**  
£9.95  
(ages 6 to 11)  
Defeat the dragon and  
save the princess of  
KOSMOS Castle.  
- a superb program  
with vast potential... (A  
& B Computing  
November 1984)



**ANSWER BACK Senior**  
£9.95  
(ages 12 and over)  
Outwit the KOSMOS robot  
and destroy the alien  
invaders...  
- superb program...  
(Personal Computing  
Today, October 1984)  
**IDENTIFY EUROPE £7.95**  
(for all ages)  
Solve the European  
jigsaw puzzle by land or  
sea.  
- **NEW RELEASE** Discover  
Europe without leaving  
your home!

The IDENTIFY EUROPE program provides a fascinating way of discovering and learning the geography of Europe. The program will provide hours of amusement for all the family and everyone is sure to benefit from it.  
The ANSWER BACK series needs little introduction. Each program combines a massive wealth of information with a fascinating and compelling game. The Senior and Junior quizzes each contain 750 questions and 3000 optional answers on General Knowledge. The Sports program is even larger containing a mind-bending 800 questions on Sport and two high-speed machine code games - Football and Tennis. But that's not all. For quiz fans, full facilities are provided for creating and saving new quizzes or modifying those supplied - and you don't need to be a programmer!

KOSMOS SOFTWARE LTD  
1 Pilgrims Close, Hartington, DUNSTABLE, Beds. LU5 6LX  
Tel. (05255) 3942



Dealers, contact Lightning, Microdeal, Proteus or Tiger.

Please supply the following programs for the BBC/Electron computer

ANSWER BACK Sport @ £9.95 ☐ ANSWER BACK Junior @ £9.95 ☐  
IDENTIFY EUROPE @ £7.95 ☐ ANSWER BACK Senior @ £9.95 ☐

Mr/Mrs/Miss .....  
Address .....  
Postcode .....

Orders are normally despatched within 48 hours

KOSMOS SOFTWARE LTD. 1 Pilgrims Close, Hartington, DUNSTABLE, Beds. LU5 6LX Tel. (05255) 3942

# FOR CONNOISSEURS OF MODERN LANGUAGE LEARNING

COMMODORE 64 • BBC (32K) • ELECTRON • SPECTRUM (48K)



Dealers, contact  
Lightning, Proteus,  
Centrist, Microdeal  
or Tiger.

Mail order  
customers  
Ask for our  
**FREE**  
Huge  
French, German or  
Spanish Dictionary  
when ordering two or  
more programs from  
the KOSMOS  
range

All titles are  
immediately  
available from good  
computer stores or  
by 24-hour mail  
order. Price £8.95  
(overseas  
orders add \$4!)

For beginners, O-level and beyond, these best-selling programs are unique and highly successful aids to language learning. Each cassette provides a comprehensive series of vocabulary lessons and a variety of self-paced learning and test modes. All accents and special characters are clearly displayed and the create command enables new lessons in vocabulary or grammar to be entered, edited as required, then saved on tape. By using this simple yet vital feature, homework lists and exam revision can be retained indefinitely and recalled on demand.  
Two cassettes are available for each language, covering thousands of words; Level A provides 16 lessons in general vocabulary; Level B provides a further 16 lessons including adjectives, adverbs and fully conjugated verb lists.



KOSMOS SOFTWARE LTD 1 Pilgrims Close, Hartington, DUNSTABLE, Beds. LU5 6LX Tel. (05255) 3942



The French Mistress Level A @ £8.95 ☐ The French Mistress Level B @ £8.95 ☐ Computer type.....(Commodore 64/BBC/Electron/Spectrum)  
The German Master Level A @ £8.95 ☐ The German Master Level B @ £8.95 ☐ Mr/Mrs/Miss .....  
The Spanish Tutor Level A @ £8.95 ☐ The Spanish Tutor Level B @ £8.95 ☐ Address .....  
Postcode .....

KOSMOS SOFTWARE LTD.  
1 Pilgrims Close, Hartington, DUNSTABLE, Beds. LU5 6LX



# Hexagram listing

## From Page 57

```

1850 FOR CX=4TO1STEP-1
1860 IF GZ(RX,CX)=3THEN LX
=CX
1870 NEXT
1880 IF LX=0THEN WX=2:GOTO
1910
1890 CX=LX
1900 PROCbranch
1910 UNTIL WX=0
1920 IF WX=1THEN PROCwin
1930 FOR RX=1TO4
1940 FOR CX=1TO6
1950 IF GZ(RX,CX)=2THEN GX
(RX,CX)=3
1960 NEXT: NEXT
1970 GX(2,2)=WX
1980 ENDPROC
1990 DEFPROCbranch
2000 RX=RX+1: SX=0: LX=CX
2010 IF GZ(RX,LX)=3THEN GX
=1
2020 IF GZ(RX,LX+1)=3THEN
SX=1: CX=LX+1
2030 IF RX=4AND GZ(RX,LX)=
3OR RX=4AND GZ(RX,LX+1)=3TH
EN SX=1: WX=1
2040 IF SX=0THEN PROClinea
r
2050 IF SX=0THEN PROCuo
2060 IF SX=0THEN GZ(RX-1,L
X)=2
2070 ENDPROC
2080 DEFPROClinear
2090 IF RX=2THEN ENDPROC
2100 IF LX=16TO2120
2110 IF LX=26TO2130
2120 IF GZ(RX-1,LX+1)=3THE
N SX=1: CX=LX+1: TX=1: RX=RX-1
: ENDPROC
2130 IF GZ(RX-1,LX-1)=3THE
N SX=1: CX=LX-1: TX=2: RX=RX-1
: ENDPROC
2140 ENDPROC
2150 DEFPROCup
2160 IF RX(4)AND LX(3)THEN
ENDPROC
2170 IF GZ(3,3)=3AND GX(2,
3)=3THEN GX(2,2)=3
2180 ENDPROC
2190 DEFPROCcheckhor
2200 CX=1: LX=1: WX=0: SX=1
2210 REPEAT
2220 TX=0
2230 IF SX=0THEN CX=1: LX=0
2240 IF CX(1)THEN GOTO2300
2250 FOR RX=1TO4

```

```

2260 IF GZ(RX,CX)=1THEN LX
=RX
2270 NEXT
2280 IF LX=0THEN WX=2:GOTO
2310
2290 RX=LX
2300 PROCacross
2310 UNTIL WX=0
2320 FOR RX=1TO4
2330 FOR CX=1TO5
2340 IF GZ(RX,CX)=2THEN GX
(RX,CX)=1
2350 NEXT: NEXT
2360 IF WX=1THEN PROCwin
2370 ENDPROC
2380 DEFPROCacross
2390 LX=RX: SX=0
2400 IF GZ(LX+1,CX+1)=1THE
N SX=1: RX=LX+1: CX=CX+1:GOTO
2430
2410 IF GZ(LX,CX+1)=1THEN
SX=1: CX=CX+1:GOTO2430
2420 IF CX(4)AND GX(LX-1,C
X)=1THEN SX=1: RX=LX-1: PROCD
iag
2430 IF CX=5AND GX(RX,CX)=1
OR CX=3AND GX(RX+1,CX)=1THE
N SX=1: WX=1
2440 IF SX=0THEN GZ(RX,CX)
=2
2450 IF TX=1AND GZ(RX,CX)=
2THEN GZ(RX,CX)=1
2460 ENDPROC
2470 DEFPROCdiag
2480 IF RX=3AND CX=3OR RX=
3AND CX=4THEN GOTO2500
2490 GOTO2510
2500 IF GZ(RX-1,CX-1)=1THE
N SX=1: GX(RX,CX)=2: CX=CX-1:
RX=RX-1: TX=1
2510 ENDPROC
2520 DEFPROCright
2530 SOUND1,2,100,20
2540 files=files+lets
2550 PRINT "That is 'i:COLO
UR2:PRINT "CORRECT":PROCwait
(3000):CLS
2560 intX=INSTR(keep$,lets
)
2570 PROCcheck(xpos$(intX),v
pos$(intX),GX)
2580 loopX=0:FOR RX=1TO2:F
OR CX=1TO4:loopX=loopX+1:IF
loopX=intXTHEN GZ(RX,CX)=GX
2590 NEXT: NEXT
2600 FOR RX=3TO4:FOR CX=2T
O5:loopX=loopX+1:IFloopX=int
XTHEN GX(RX,CX)=GX

```

```

2610 NEXT: NEXT
2620 IF GZ=3THEN PROCcheck
ver ELSE PROCcheckhor
2630 ENDPROC
2640 DEFPROCwrong
2650 SOUND1,-15,12,10: SOUN
D1,-15,0,10
2660 PRINT "That is 'i:COLO
UR2:PRINT "WRONG":PROCwait(
5000):CLS
2670 COLOURGX:PRINT "The wo
rd is 'i:COLOUR2:PRINT word$(
numX):PROCwait(10000):CLS
2680 ENDPROC
2690 DEFPROCtimeup
2700 SOUND1,3,100,20
2710 PRINT "TIME UP!":PROCw
ait(3000):CLS
2720 PRINT "The word is 'i:
COLOUR2:PRINT word$(numX):PR
OCwait(10000):CLS:COLOURGX
2730 ENDPROC
2740 DEFPROCwin
2750 SOUND1,1,100,100
2760 IF GX=1PRINT "BLUE is
the winner.":PROCwait(3000)
:VDU19,3,15,0,0,0:PROCwait(
10000):CLS:VDU20,19,1,5,0,0
,0
2770 IF GX=3PRINT "WHITE is
the winner.":PROCwait(3000)
:VDU19,3,15,0,0,0:PROCwait
(10000):CLS:VDU20
2780 FOR RX=1TO5:FOR CX=1T
O5:GX(RX,CX)=0
2790 NEXT: NEXT
2800 ENDPROC
2810 DEFPROCwait(X):FOR Z
X=1TO2:GX: NEXT: ENDPROC
2820 DEFPROCintro
2830 VDU19,1,5,0,0,0
2840 COLOUR2:PRINTTAB(14,1
)"HEXAGRAM" TAB(14)"*****
*":COLOURGX:PRINT "...is a ga
me for 2 players.Unscramble
the" "anagram within the t
ime allowed.The" "first le
tter is the one in the hexa
gon."
2850 PRINT "... Try to ma
ke a pathway..." ACROSS
the board if you are blue
or"" DOWN the board if y
ou are white."
2860 COLOUR2:PRINT""
Type 1 for easy words""
Type 2 for harder words"
2870 COLOUR1:PRINT"" BL

```

```

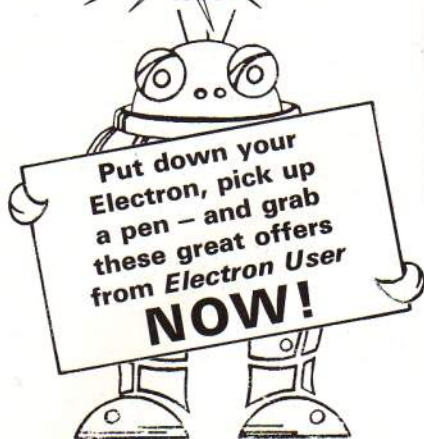
UE PLAYER....what level?
'i:FX=GET-48:PRINT:FX
2880 IF FX(4)AND FX(2)THEN
CLS:GOTO2840
2890 COLOURGX:PRINT"" WH
ITE PLAYER....what level?
'i:EX=GET-48:PRINT:EX
2900 IF EX(4)AND EX(2)THEN
CLS:GOTO2840
2910 VDU23,1,0,0,0,0
2920 COLOUR2:PRINT""
Do you want sound? (Y/N):R
EPEAT:gets=GET$:UNTIL INSTR
("YyNn",gets)<0
2930 IFgets="N"ORgets="n"
HENFX=210,1
2940 CLS
2950 ENDPROC
2960 REM summary of instru
ctions
2970 DEFPROClink
2980 VDU26
2990 *FX15,0
3000 CLS:PRINTTAB(8,5)"Ens
ure CAPS LK off.""Text c
olour is same""as colour
of player.""Press RETURN
after""typing in an ans
wer.""Use ESCAPE to chang
e""levels."
3010 COLOUR2:PRINTTAB(2,28
)"Press any key" TAB(3)"to
continue":wait=GET
3020 CLS
3030 ENDPROC
3040 DEFPROCrelocate
3050 VDU21
3060 *KEY$*TAPE:MOX=PAGE-
#E00:FORIX=PAGE TO TOP STEP
4:1(1)-O1=1X:NEXTI:(TOP-D
X)=255:MPAGE=#E00:MOLD:MRUN
IFM"
3070 *FX12,0
3080 *FX130,0,120
3090 ENDPROC
3100 MODE6
3110 *FX12,0
3120 *FX14,0
3130 REM omit next line un
til debugged
3140 IF ERR=17THEN RUN
3150 REPORT:PRINT" at line
":ERL

```

*This listing is included in this month's cassette tape offer. See order form on Page 61.*

# electron

user



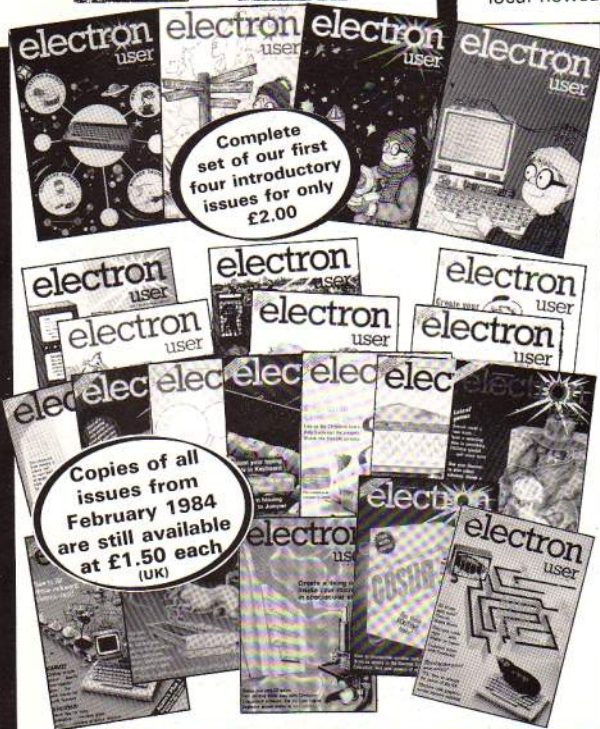
## Be one of the first to get each issue

A subscription will ensure you get your own personal copy **HOT OFF THE PRESSES** month after month for the next year.

Every owner of an Electron – and everyone thinking of buying one – needs to get *Electron User* every month. It's the brightest, most authoritative yet completely independent guide to a machine that has so much potential you will never tire of reading about its remarkable capabilities.

You can buy *Electron User* from your local newsagent or station bookstall. Or you

can take out a 12 months subscription and have it delivered to you by post.



## Your Electron needs protecting!

Protect your Electron with our luxury dust cover made of soft pliable water-resistant vinyl, bound with strong cotton and decorated with *Electron User* logo.

**£3.95**



## Keep your collection of *Electron User* complete with these handsome binders

Bound in attractive red pvc with the *Electron User* logo in gold blocking on the spine, this binder will hold 12 magazines firmly secured in place by metal rods. **£3.95**



All prices include postage, packing and VAT, and are valid to August 31

Please enter number required in box £ p

**Electron User back issues**

£1.50 UK	Set of 4 introductory issues	3006	
£2.25 Overseas (Surface)	February 1984	3007	
Air mail application	March 1984	3008	
	April 1984	3009	
	May 1984	3010	
	June 1984	3011	
	July 1984	3012	
	August 1984	3013	
	September 1984	3014	
	October 1984	3015	
	November 1984	3016	
	December 1984	3017	
	January 1985	3018	
	February 1985	3019	
	March 1985	3020	
	April 1985	3021	
	May 1985	3022	
	June 1985	3023	
	July 1985	3024	

**Electron User  
annual  
subscription**

UK £12	3001	
EIRE £13 (IR £16)	3002	
Overseas (Surface) £20	3003	
Overseas (Airmail) £40	3004	

Commence with \_\_\_\_\_ issue TOTAL \_\_\_\_\_

**Classroom Computing  
on the Electron**

Cassette £5.95	3070	
Magazine £1.95	2210	
Cassette and Magazine £7.00	3071	

TOTAL \_\_\_\_\_



**Electron  
User  
tapes**

£3.75

26 introductory programs	3032	
Lunar Lander	February 1984	3033
Chicken	March 1984	3034
Spacehike	April 1984	3035
Rally Driver	May 1984	3036
Money Maze	June 1984	3037
Golf	July 1984	3038
Castles of Sand	August 1984	3039
Haunted House	Sept 1984	3040
Breakfree	Oct 1984	3041
Star Fighter	Nov 1984	3042
Christmas Box	Dec 1984	3043
Space Battle	Jan 1985	3044
The Kingdom of Craal	Feb 1985	3045
Mr Freeze	March 1985	3046
Super Archer	April 1985	3047
Skramble	May 1985	3048
Quasimodo	June 1985	3049
Manic Mole	July 1985	3050
Diggs	August 1985	3051

**Cassette tape  
annual subscription**

£40 (UK) 3005 ☐

Overseas add £6

Commence with \_\_\_\_\_ tape (state month) TOTAL \_\_\_\_\_

**Dust cover**

£3.95 3058 ☐

TOTAL \_\_\_\_\_

**Binder**

£3.95 UK 3059 ☐  
£5.00 Overseas

TOTAL \_\_\_\_\_



**Ten of the Best**

£5.95 (UK & Overseas) Volume 1 3068 ☐  
Volume 2 3069 ☐

TOTAL \_\_\_\_\_

**Getting Started in  
BBC Basic**

£5.95 2289 ☐

TOTAL \_\_\_\_\_

**Electron Advanced User Guide**

£9.45 3072 ☐  
Overseas add £1 postage

TOTAL \_\_\_\_\_

Overseas postage: Add 50p per item unless otherwise specified.

Payment: please indicate method (✓) TOTAL \_\_\_\_\_

☐ Access/Mastercharge/Eurocard

No. \_\_\_\_\_

☐ Barclaycard/Visa

No. \_\_\_\_\_

☐ Cheque/PO made payable to Database Publications Ltd.

Name \_\_\_\_\_ Signed \_\_\_\_\_

Address \_\_\_\_\_

Send to: **Electron User, Freeport, Europa House,  
68 Chester Road, Hazel Grove, Stockport SK7 5NY.**  
(No stamp needed if posted in UK) Please allow 28 days for delivery

You can also order by phone.

061-480 0171

Don't forget to  
quote your  
credit card  
number and  
give your  
full address

E  
EU/8



See Page 42 for the program listings contained in the monthly cassette.





# HIGHLIGHT SOFTWARE

for the

## BBC & Electron

Reading Pack 1 (Age 5-8)

### SPLASHDOWN & FIREFIGHT

Building 3 letter words sl, sm, sn, sp, bl, etc.

Reading Pack 2 (Age 6-9)

### PYRAMIDS & SPOOBSH

th, ch, sh, wh oo, ee, ea, oi, ou, oa, ai

Reading Pack 3 (Age 7-10)

### MAGIC E & BREAKIN

"Magic e" spelling rule soft 'c', soft 'g' sounds.

Reading Pack 4 (Age 8-11)

### SORT OUT & LETTERBUGS

Alphabetical Sorting Unscrambling hidden words

### Latest Release:

"ENTERTAINING ENGLISH" (Age 7-11)

"BUSY": Verbs and adverbs

"TIMESLIP": Past and present tenses of verbs.

Price per Pack

BBC 40 Track Disc: £11.95 BBC/Electron Cassette: £7.95

Programs can be obtained from selected branches of BOOTS and JOHN MENZIES, from MICROPOWER dealers and from Educational Software specialists including FIVE TO TWELVE, PROTEUS COMPUTING, SOFTWARE CENTRE or by Mail Order.

**Send for your FREE catalogue with full program range NOW!**

HIGHLIGHT SOFTWARE

FREEPOST, Barry, CF6 6YZ.

Telephone: (0446) 745482

LEARNING IS FUN WITH HIGHLIGHT!

HIGH QUALITY GRAPHICS!

## ADVERTISERS INDEX

21st Software	26
Advanced Computer Products	13
Brain Train Club	62
Cumana	47
D.A.C.C.	56
Epic Software	35
Golem Ltd	56
Highlight Software	62
Icon Software	63
Kosmos Software	58
Slogger Ltd	22
Software Classics	62
Solidisk	8 & 9
Superior Software	64
Vine Micros	62

AT LAST!

THE ANSWER TO FINDING GOOD QUALITY SOFTWARE FOR YOUR BBC/ELECTRON

### MEMBERS RECEIVE:

- ★ Discount prices on all Tapes & Discs
- ★ Information & Advisory Service
- ★ Regular Newsletter
- ★ Free Postage on 3 or more Titles
- ★ Rapid Delivery
- ★ No Obligation to Purchase

**ALL FOR ONLY £3.00 PER YEAR!**

Send large SAE for Catalogue & full details

THE BRAIN TRAIN CLUB  
NORTHINGTON HOUSE

59 GRAY'S INN ROAD LONDON WC1X 8TL

## SOFTWARE CLASSICS

for the Electron & BBC Micro

### LEONARDO £6.90

Interactive graphics program. Scaleable grid; 16 colours and text sizes; pan, tilt and zoom; rectangle, circle and triangle filling; rubber-banding; fast save/load; analogue joystick or keyboard control.

### DARTS £6.90

Full feature, 2-player game. Choice of 3 boards. On-screen chalkboard. Needs analogue joysticks - and plenty of skill!

### FIRESIDE GAMES £5.75

Dominoes, Battleships, Pelmanism and S.J.N. Full colour and sound. Terrific fun for all the family!

### CHARACTERS £4.60

Character definition utility. Large screen display, full editing and VDU 23 codes. Comes with over 400 pre-defined characters!

### CHARIVARIA £4.60

A collection of 5 educational programs: Ordnance Survey mapping (National Grid); Infinite precision math calculator; ASCII to Morse decoder Cartesian and polar equation plotter.

### 3-D DESIGN £7.50

Create designs from front, end and plan views, and the computer creates a wire-frame image, which is seen in colour or as a true STEREOSCOPIC image with a choice of 'lenses', and may be displaced, rotated, enlarged or reduced. Full editing with rubber-banding. Fast save-load. Analogue joystick or cursor control. Complete with 3-D spectacles.

★★★★

Discs: Add £3.00 (£5.25) or £4.50 (£3.5) to total order. Send cheque/PO for fast despatch or SAE for full catalogue to:

### SOFTWARE CLASSICS

2 Connie Street, Openshaw, Manchester M11 2JT



## HOW TO BE SECOND BEST...

We tried to write an exciting advertisement about the **ADDCOMM ROM**.

We wanted to tell you that **ADDCOMM** is...

"probably the best value for money out of the Toolkits", but "Acorn User" (Oct. '84) and "Micro User" (Oct. '84) told you first, followed by "Personal Computing Today" (April '85) and "The BBC ROM Book" by Bruce Smith. We thought you should know that **ADDCOMM** is...

"Highly recommended for graphics programming", but "Using the BBC Micro" said that in their No. 1 issue.

We could have informed you that the...

"**ADDCOMM** chip vastly increases the power of the Micro from the programmers' point of view", but "Education Equipment" (Oct. '84) found out first.

We could sum up by simply announcing...

"**ADDCOMM** is brilliant".

but, guess what, "Electron User" (June '85) got in before us!

So, that just leaves us with the boring bits of what it costs:

**£28.00 including VAT and Post.**

and where to get it.

Vine Micros

Marshallborough, Nr. Sandwich,  
Kent CT13 0PG.

(Or some Dealers)

If you only want to read about **ADDCOMM**, send us a stamp for the sixteen page brochure which also contains recent reviews.

**ADDCOMM** is suitable for the ELECTRON with ROM Box, also the BBC B D.S. 1.20 and the BBC B+.

SEE US AT



25th-26th July 1985  
Barbican Centre  
London EC2



# NEW SOLID GOLD Software...

**BBC ELECTRON**  
**AMSTRAD**



"FANTASTIC... YOU'LL LOVE IT!"

## Caveman Capers

Ogg the caveman has just found some new transport... Kickstart the turtle. Help Ogg ride Kickstart, avoiding snakes, pterodactyls, logs, load-stools, dinosaurs etc. Continuous scrolling multi screen action. 60 levels. Excellent graphics.

**BBC...£7-95 Electron...£7-95**

10 Spectrum screens



"A TRIP INTO A BIOLOGICAL FANTASY WORLD"

## Frankenstein 2000

Perform revolutionary micro-surgery during this fantasy journey through the long lost monsters' body. Deposit the secret formula from your specially equipped micro-sub throughout the body's organs. Multi-screen with excellent graphics.

**SPECTRUM...£6-95**  
**Electron...£7-95**  
**BBC...£7-95**

6 BBC screens



"UNBELIEVABLY ADDICTIVE"

## Drain Mania

Theodore, a daring athletic young chap, is lost down the sewers. As well as fireballs and slippery floors, all kinds of horrible beasts are on the prowl. Head-butting them from below will kill them but beware... No one has yet escaped. Will you be first? A totally addictive multi-screen game. Superb Music Score.

**BBC...£7-95 Electron...£7-95**



BBC Hi-res Mode 1 screens



"BEST GAME EVER REVIEWED"

**Bug-Eyes** 10 screens  
Your move in on earth... Your Good luck Agent

Beware of the Bug-Eyes... Closer and closer they move in on earth... Your mission is to enter the invading spacecraft and cunningly steal through the 10 levels of the ship to destroy the master power generator... Good luck Agent Starman!

**SPECTRUM...£6-95 BBC...£7-95 Electron...£7-95**

## FLIP!

A new concept in computer games. **CARTOON STRATEGY!** A unique blend of game playing and learning that puts meaning into the word 'EDUTAINMENT'. A really excellent FAMILY game that will create hours of fun & excitement. Superb Graphics & Music

**BBC...£7-95**  
**Electron...£7-95**



## Contraption

An extravaganza of mad-cap lunacy as the zany professor favourably searches for the weird objects needed to complete the crazy experiment. Excellent Cartoon style graphics.

**BBC...£8-95**



"INCREDIBLE COMBINATION OF SIGHT AND SOUND"



65 HIGH STREET, GOSFORTH  
TYNE & WEAR.  
NE3 4AA

coming soon...  
**SUPA-NOVA**  
explosive space action

Dealers Contact:  
Microdealer U.K. \* Centresoft \*  
R & R \* Leisuresoft \* Laser \*  
CSM \* Limestone \* Wonderbridge \*  
Websters \* TBS \* Thorn-EMI \*  
Lightning \* Bulldog \* Twang \*

Send S.A.E. for catalogue.  
To order Direct:  
Send cheque or P.O.  
payable to ICON.  
TEL: (091) 2846966

From the authors of  
**KILLER GORILLA & MR EE!**





A CHALLENGING ARCADE-STYLE ADVENTURE

# REPTON



THE INTRODUCTORY SCREEN



AN EGG ABOUT TO HATCH



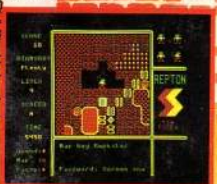
SCREEN L



A LURKING REPTILE



THE MAP (SCREEN H)



ACORN ELECTRON VERSION

**\$9.95 cassette / £11.95 disc**

**ACORN  
ELECTRON  
BBC  
MICRO**

Your mission is to retrieve all the diamonds from a series of underground caves; some of the diamonds are easy to collect but many are located in cleverly-constructed traps of falling rocks and boulders. Other diamonds lie nearby giant eggs which hatch into ferocious reptiles. You are aided by maps to guide your way through the 12 increasingly difficult levels. Each level features 4-way screen-scrolling over an area of 16 times the size of the screen — an enormous challenge by any standards! A fascinating strategic game with an ingenious "password" feature which enables you to skip screens which you have already completed once. Our best game yet!

**Competition**

When all 12 levels of Repton have been completed in succession, a congratulatory message is displayed on the screen. The first person to send us a photograph of this screen will win **£100**. Closing Date: 30th September, 1985.

**WE PAY UP TO 20% ROYALTIES FOR HIGH QUALITY BBC MICRO AND ELECTRON PROGRAMS.**



**SUPERIOR SOFTWARE LTD.**

Dept. MU7, Regent House,  
Skinner Lane, Leeds 7.  
Tel: 0532 459453.



#### OUR GUARANTEE

- (1) All our software is despatched within 48 hours by first-class post.
- (2) In the unlikely event that any of our software fails to load, return your cassette to us and we will immediately send a replacement.

